

*Education
for Life*



Carleton
UNIVERSITY

1999/2000

Undergraduate Calendar



1999/2000
Undergraduate
Calendar

www.carleton.ca



Code No. Building Name

AA	22	Architecture Building
TT	29	Carleton Technology and Training Centre
CC	28	Colonel By Child Care Centre
DT	21	Duntun Tower
EL	16	Environmental Laboratories
GH	18	Glengarry House
GR	14	Grenville House
HP	13	Herzberg Laboratories
LH	6	Lanark House
LS	25	Life Sciences Research Building
LA	15	Loeb Building
ME	10	Mackenzie Building
ML	2	MacOdrum Library
MB	11	Maintenance Building
MC	27	Minto Centre
PA	3	Paterson Hall
AC	9	Physical Recreation Centre
RH	5	Renfrew House
AB	17	Robertson Hall
RU	14	Russell House
SR	24	Social Sciences Research Building
SA	4	Southam Hall
SP	23	St. Patrick's Building
SC	12	Steacie Building
SD	26	Stormont-Dundas House
TB	1	Tory Building
UC	7	University Centre
CO	19	University Commons

**Visitor Parking
Only in these Locations**
 Parking Garage (P9)
 Parking Lot 1
 Parking Lot 2
 Parking Lot 5
 Parking Lot 6
 Parking Lot 8

- Bank
- Bookstore and Computer Store
- Bus Stops
- ◆ Carleton University Art Gallery
- ⓔ Entrances to Campus
- ⓓ Information Carleton
- ❖ Post Office
- ⓧ Tunnel Entrance
- ⓧ Tunnel Entrance with Stairs
- Tunnels



Carleton

UNIVERSITY

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Fifty-Eighth Annual
Undergraduate Calendar
for the Academic Year 1999-2000

This Calendar is published several months in advance of the beginning of the academic year. The University reserves the right without liability or penalty, and without notice, to make changes in the services and programs it offers, including alteration of the fee schedules and cancellation of particular courses.

The arrival of the year 2000 is expected to affect computers, software and date dependent imbedded systems and threatens to disrupt day to day operations in many areas. The University is assessing, addressing and making appropriate contingency plans to avoid or minimize disruptions of the campus and those dealing with the University. Students should also take measures within their control to ensure compliance and assume responsibility for their own contingency plans. **Carleton University hereby disclaims any liability whatsoever for disruptions to operations on the campus or connected thereto and disclaims any and all liability for damages, howsoever arising, out of any date or time recognition or 'Year 2000' disruption.**

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Educational Equity Policy

Preamble

In support of Carleton University's commitment to Section 15 of the Federal Charter of Rights and Freedoms, Sections 4 and 13 of the Ontario Human Rights Code, and the University's mission statement,

Statement of Principles

Carleton University is committed to providing equity in its educational programs and services and a welcoming environment for all individuals regardless of race, ancestry, place of origin, colour, ethnic origin, national origin, creed, sex, sexual orientation, age, marital status, family status, or disability as defined in the Human Rights Code of Ontario.

Carleton University strives for the best possible educational experience for all of its students. The University attempts, to the best of its ability, to encourage and assist all students to succeed academically and as members of the University community.

Educational Equity Policy Statement

In support of its commitment to excellence in teaching, scholarship, and research, Carleton University seeks to identify University policies, programs, and services that need to

be changed, enhanced, or created, subject to the availability of resources, in order to:

(a) increase the access, retention, and graduation of groups of students who have traditionally been under-represented, under-served, and/or disadvantaged in University programs, and

(b) provide a supportive and welcoming learning environment for all students.

The designated groups for education equity include, but are not limited to: women; Aboriginal peoples; persons with disabilities; racial, ethnic, or visible minorities; the economically disadvantaged; mature and part-time students; gay men, lesbians, and bisexuals; and international students.

The University undertakes to provide reasonable accommodation to these groups and, to the extent that it is possible, to implement special measures to support the achievement of the University's education equity goals.

In support of its commitment to achieve and maintain a hospitable campus climate for all students, faculty, and staff, the University undertakes to provide education and training on human rights issues as these relate, inter alia, to curriculum and pedagogy.

Policy on Discrimination and Sexual Harassment

Carleton University is a community of faculty, staff, and students who are engaged in teaching, learning and research. Its members are part of the community at large and are governed by the law common to all persons. But membership in the academic community also entails certain rights and responsibilities. The University respects the rights of speech, assembly, and dissent; it prohibits discrimination on the basis of race, ancestry, place or origin, colour, ethnic origin, national origin, creed, sex, sexual orientation, age, marital status, family status, political affiliation or belief, or handicap that is defined as such in the Human Rights Code of Ontario; it requires tolerance and respect for the rights of others; and it promotes an environment conducive to personal and intellectual growth.

(Please refer to Offences of Conduct, Academic Standing, p. 49.)

The University

- Electronic Access to the Undergraduate Calendar
- Accreditation of the University
- Carleton University - Education for Life
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- Academic Standing and Conduct
- Mention: français
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- Continuing Education
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Electronic Access to the Undergraduate Calendar

Electronic versions of the Undergraduate Calendar can be accessed on the Internet. The electronic version is usually available within two months after the print version (i.e. by June 1). Every effort has been made to ensure the accuracy of these electronic versions, but in the case of any discrepancy, the printed Calendar shall be considered to be the University's official statement.

The electronic versions can be accessed by all users at <http://www.carleton.ca>. For those with campus CHAT accounts, these electronic versions are also available under the Carleton Information option.

Accreditation of the University

Carleton University, a founding member of the Council of Ontario Universities, enjoys full accreditation by the Ministry of Education and Training of the Province of Ontario.

The University is a charter member of the Association of Universities and Colleges of Canada. It is a member of the Association of Commonwealth Universities and participates fully in the Commonwealth Scholarship and Fellowship Plan. It is also a member of the International Association of Universities.

The baccalaureate degree programs in Aerospace, Computer Systems, Civil, Electrical, Environmental and Mechanical Engineering are accredited by the Canadian Engineering Accreditation Board of the Canadian Council of Professional Engineers.

The Bachelor of Computer Science Honours Degree Program is accredited by the Accreditation Council of the Canadian Information Processing Society and the Computer Science Association.

The School of Industrial Design was established at Carleton on the recommendation of a study prepared by the Association of Canadian Industrial Designers. Initial funding for the school was supplied by Design Canada, Ministry of Industry, Trade and Commerce.

The School of Social Work program has been formally accredited by the Canadian Association of Schools of Social Work.

Carleton University participates in the Ontario Student Assistance Program, other provincial assistance programs and the Canada Student Loans Program and is fully recognized as one of the few participating institutions outside the province of Quebec for bursary assistance through the Quebec Loans and Bursaries Program.

Carleton University's degree programs are recognized in the United States by the Federal Guaranteed Student Loans Program and for student aid to veterans through the Veterans Administration.

If you or a member of your family are thinking about joining the more than 17,000 students who'll be making their way to Carleton University next year, you're probably interested in learning more about our programs and services, about our accomplishments and reputation, about the people who study and work here.

This calendar contains vital information about the University's academic programs, regulations and procedures. It is information that is not only important to prospective students, but to returning students, visiting scholars, researchers and others who are keen on getting a reading of Carleton's academic strengths and overall direction.

If you're already a member of the Carleton community, much of the information contained in this introduction will already be familiar to you. If you're still getting to know us, this section is intended to provide you with a sense of what we have to offer and what it's like to be a Carleton student. We hope that what you find here will pique your interest, and that you'll want to get to know us better. A list of additional sources of information that you'll find at the end of this piece can help.

A reputation for excellence

Our students come from every province and territory in Canada and from nearly 100 countries from around the world. Why do they choose Carleton? For most, it's a combination of things. Our worldwide reputation for quality programs—especially in the fields of public affairs, management and high technology and in the liberal arts disciplines, including those offered by our highly acclaimed College of the Humanities—is usually an important factor.

How did we earn this reputation for excellence? Here are just a few examples.

- Carleton has won more of the coveted 3M Teaching Awards than any other university in Ontario, and per faculty member, more than any other university in Canada.
- Carleton students have a better success rate in obtaining Ontario graduate scholarships than students from the University of Toronto, Queen's University, McMaster University or the University of Western Ontario.
- Carleton is the largest supplier of graduates to Canada's premier high-tech corporation, Nortel.
- In 1997 sponsored research at the University was valued at \$22.5 million.
- For the second year in a row, two Carleton engineering students have won prestigious awards from the National Research Council. The awards (\$30,000 each) are part of the Women in Science and Engineering program.
- Twice in the past four years, Carleton School of Business graduates have won gold medals in the Canada-wide Uniform Final Chartered Accountant Examination.
- Graduates from our economics, sociology and statistics programs rank number one on the recruiting lists of the federal Public Service Commission.

Our reputation for excellence is built, in part, on the success of our students. We're determined to attract a larger proportion of Canada's very best, and thanks to our alumni—who are among the most generous in the country for a university our size—we're able to offer a generous scholarship program to reward students who have excelled at the secondary school level. Our top undergraduate award is valued at \$20,000 over four years.

A pioneering spirit

The dynamic, pioneering spirit that gave birth to Carleton nearly 60 years ago is still very much alive at the University today. In the early 1940s, our founding president, Henry Marshall Tory, dreamed about creating a non-sectarian university in the nation's capital to provide learning opportunities for the thousands of men and women who had interrupted their studies to come to Ottawa in support of the war effort.

Tory was a seasoned veteran of the Canadian and international university communities. He had already served as founding president of two universities in Canada—the University of Victoria in British Columbia and the University of Alberta—and had helped to create a university in Great Britain. Long after his retirement, he and a group of like-minded citizens in Ottawa, founded Carleton College in 1942.

For years, the college operated from church basements and rented facilities, without the benefit of a university charter or government grants. Full-time programs in journalism and public administration—the first to be offered in Canada—were introduced in 1946. In 1957, an act of the Ontario legislature bestowed degree-granting status on the institution, and Carleton College became Carleton University.

While we've grown to serve an increasingly diverse national and international clientele—providing undergraduate and graduate degree programs in more than 50 areas of study and supporting more than 90 research centres across campus—we've never lost sight of our roots in the Ottawa community. Today, our School of Continuing Education serves part-time and full-time learners throughout Eastern Ontario and West Quebec via Carleton's instructional television (itv) programs offered through local cable television and a variety of other delivery systems.

An education for life

Our programs, especially those at the undergraduate level, are designed to provide you with an education for life. Regardless of your choice of faculties, we'll help you to develop critical, analytical and communications skills that you'll be able to use throughout your lifetime, both at work and at home.

We know that, for many students, a university education is an important first step in preparing for the job market. In addition to a sound academic background, having hands-on experience can be a deciding factor in your employability. We offer a wide array of co-op and industrial experience programs, internships, practicums, apprenticeships and voluntary work placements to students who want to complement their academic studies with on-the-job experience. In addition, we provide on-campus jobs to more than 1,000 undergraduate students through our work-study program.

Being familiar with a foreign culture has always been an asset, but in today's global economy, having that kind of experience can also give you an added advantage in the workplace. Carleton has exchange agreements with some 50 universities in more than 30 countries, providing you with an opportunity to learn about another culture first-hand.

Friendly, caring staff; quality programs; quality services

Our students tell us that one of the things they like most about Carleton is the University's friendly, informal and caring atmosphere. You'll find that our teaching and support staff are accessible and genuinely interested in helping you to succeed. Our commit-

ment to equity has led us to establish offices and centres to address the special concerns of aboriginal peoples, women, race equity, people with disabilities, international students, and gays, lesbians, and bisexuals, and to help make every member of the University community feel welcome and at home.

Our students also give us high marks for our services. For example, Carleton was one of the first universities in Canada to offer Internet access to all of its students. Today, our award-winning CHAT program provides students and faculty with news groups, discussion groups, email and Internet services that allow them to explore learning opportunities far beyond the classroom, 24-hours-a-day.

The MacOdrum Library is another key service, housing more than one million volumes and an extensive collection of microfilms, archival material, maps and documents that are accessible through an on-line catalogue system.

Throughout the year, we offer workshops and seminars that can help you make a successful transition to university studies and provide you with life skills that you can use throughout your university career and beyond. In the first year of the B.A. program, small group seminars are led by a faculty member who acts as a teacher and mentor helps students find their place in the intellectual life of the University. Our study workshops deal with issues such as time management, campus resources, financial planning, essay-writing, note-taking, speed-reading and learning how to use various word-processing software. In addition, the University's Writing Tutorial Service offers one-to-one tutoring—free-of-charge to students in all faculties—including help with your class assignments, from first draft to final revisions.

The advantage of studying in Canada's capital

Our location in Canada's capital is another reason why many students choose to study at Carleton. We've used our location in Ottawa to good advantage by forming close ties to federal government departments and research laboratories and to the dozens of high tech companies throughout the region that, together, make up one of the largest concentration of high tech firms in the country.

We've also formed ties to the University of Ottawa, combining our academic strengths, expertise and research resources to offer joint graduate programs in science and engineering.

Being in the nation's capital has helped to shape the overall direction of many of our academic programs. Historically, we've tended to approach the study of a variety of disciplines—journalism, public administration, social work and international affairs are some examples—from a distinctly Canadian perspective. This, as well as our pioneering work in the area of interdisciplinary studies, is another reason why Carleton is the first choice of so many students from across the country.

You'll find Ottawa is a lively blend of culturally diverse communities—of English, French and new Canadians—of historic landmarks and vibrant high-tech companies, of quite residential neighborhoods and bustling outdoor markets. Just minutes away from campus are a host of research and study resources you simply won't find elsewhere—the National Archives, the National Research Council, the National Arts Centre, the National Gallery, the Museum of Civilization and the Museum of Science and Technology are but a few examples.

A vibrant campus

Like Ottawa, Carleton is clean and safe and built to a human scale. Our beautiful 62-hectare campus, bordered by the Rideau River and the historic Rideau Canal, is just 10 minutes from downtown.

The campus is home to some 1,700 residence students. An extensive tunnel system that links the campus's 29 buildings makes Carleton one of the most accessible universities in the country.

Campus life is enriched by more than 100 clubs and student organizations including an FM radio station, a student-run weekly newspaper and theatre troupe. In addition, we offer a wide range of men's, women's and co-ed intramural sports, plus nine varsity teams for women and seven for men.

Our recreational facilities include a 50-metre indoor pool, saunas and whirlpools, a fitness centre, a heavy weight room, nine air-conditioned international squash courts, five outdoor tennis courts, a double gymnasium and a football field. And to top it off, there are fitness classes to satisfy just about every interest, from ballet and karate, to scuba-diving, canoeing, tennis and rock-climbing.

A network of recreational pathways right next door to the campus connects to hundreds of kilometres of jogging and cycling pathways that crisscross the national capital region. The Rideau Canal and Dow's Lake are also adjacent to the campus, offering skating in the winter and boating and canoeing in the spring, summer and fall.

Learning more about Carleton

We hope this brief overview of Carleton will make you want to learn more about us. The program descriptions contained elsewhere in this calendar are a good place to start. If you have any questions after reviewing this material, here are some sources for additional information.

General information on undergraduate academic programs and admissions

Undergraduate Recruitment Office
315 Robertson Hall
Carleton University
1125 Colonel By Drive
Ottawa, Ontario
K1S 5B6
Toll-free (in Canada): 1-888-354-4414
Tel: (613) 520-3663
Fax: (613) 520-3847

Admissions for graduate programs

Faculty of Graduate Studies and Research
1512 Dunton Tower
Carleton University
1125 Colonel By Drive
Ottawa, Ontario
K1S 5B6
Tel: (613) 520-2525
Fax: (613) 520-4049

Special and non-degree programs

School of Continuing Education
302 Robertson Hall
Carleton University
1125 Colonel By Drive
Ottawa, Ontario
K1S 5B6
Tel: (613) 520-3500
Fax: (613) 520-4456

Scholarships, bursaries and awards

Awards Office
202 Robertson Hall
Carleton University
1125 Colonel By Drive
Ottawa, Ontario
K1S 5B6
Tel: (613) 520-3600
Fax: (613) 520-3560

Carleton Glossary

The following are some terms frequently used throughout this Calendar, together with a brief explanation of their general meaning.

Academic Standing

The performance of all students is evaluated regularly to determine whether they are meeting the standards prescribed for continuing in their program. Standards and performance indicators vary according to individual Faculties and programs.

Arts and Social Sciences

At Carleton, there is a Division of Arts and Social Sciences, and a Faculty of Arts and Social Sciences. The former—the Division—comprises the Faculty of Public Affairs and Management and the Faculty of Arts and Social Sciences. The latter—the Faculty—comprises those academic units listed on p. 10.

arts or social science

The phrase “arts or social science,” when used in this Calendar, refers to all those disciplines in the Faculty of Arts and Social Sciences and the Faculty of Public Affairs and Management.

Audit

To audit a course is to attend without working for or expecting to receive formal credit. Formal registration is required and regular tuition fees apply. Students are not permitted to submit work or to write formal examinations.

Bachelor's Degree (Baccalaureate)

A university degree, for which a student follows an undergraduate degree program, (e.g. B.A.—Bachelor of Arts).

Bursary

A monetary award based on good academic standing and financial need.

Calendar

A university publication listing courses, degree requirements, faculty and university regulations, and names of faculty members.

CI - Continuation Index

The Continuation Index is one of the factors used in the Faculties of Arts and Social Sciences and Public Affairs and Management to determine students' academic standing in their degree program and eligibility for graduation. The method of determining the CI and the effects that it has on students are described in Sections 5 and 7 under Regulations.

Concentration

In the Division of Arts and Social Sciences, a way of completing a degree that requires students to commit to certain courses or course patterns within the Major discipline. These students may take core or foundation courses in common with all other students, but once they have committed to a Concentration within the program they are bound to follow a specified sub-set of courses in order to be certified as having completed that particular Concentration. A current example of a Concentration would be the Concentration in Geographic Information Processing (GIP) in Geography.

Course

A unit of study in a given discipline identified by a unique number and name in a given department.

Credit

The weight value given to an academic course. The basic unit of academic work at Carleton is the full credit, which is indicated with a weight value of 1.0 on all records documents. A course marked with the symbol ★ has a weight value of one-half credit, and is indicated with a value of 0.5 on all records documents. Courses may have weight values greater than 1.0 (e.g. 1.5, 2.0, 2.5 credits), and are also indicated in this Calendar.

Department

A division of a faculty concerned with a specific branch of instruction of study.

Discipline

A branch of learning or a field of study.

Faculty

(a) A major teaching division of the University, divided into departments, schools or other units and headed by a dean. (e.g. Faculty of Arts and Social Sciences);

(b) The academic teaching staff of the University.

Full-time student

A student who is registered in a minimum of 4.0 credits or the equivalent during the Fall/Winter session.

GPA - Grade Point Average

The Grade Point Average is a number calculated by dividing the number of grade points achieved in a set of successfully completed academic courses by the total credit value of those courses. A system of Weighted Grade Points is used in the Faculty of Engineering. Some individual departments in other faculties also use weighted grade points.

Honours Degree Program

A specialized university program, normally requiring four years or 20.0 full-credits or their equivalent to achieve the degree.

Internal Transfer

The process of applying for and receiving approval to change from one degree or certificate program to another. Applications for such transfers must be completed in accordance with published deadlines and applicants must meet the requirements of the program into which they wish to transfer.

itv

Instructional Television. The provision of courses to both on and off-campus students through cablevision and videocassette distribution services.

Letter of Permission

A statement provided to students by their home universities, giving them permission to take academic courses elsewhere and to transfer those courses to the home university. At Carleton, students must obtain such Letters from their Faculty Registrarial Services Offices, prior to taking the courses which are to be transferred.

Major(s)

The discipline(s) or field(s) in which a student specializes during the course of degree studies. In some programs, options and program option(s) represent equivalent terminology.

Major Degree Program

A university program in the Faculty of Science, normally requiring three years or 15.0 full-credits or their equivalent to achieve the degree.

Mature Applicant

Individuals who lack normal entrance requirements as published in the Calendar, but who will be 21 years of age or over by December 31 of the year in which they wish to enroll, may receive consideration for admission to a degree program either on a full-time or part-time basis.

Minor

A specified number of credits within a discipline that will provide students in another discipline with a grounding in the second discipline. The credits necessary for a Minor can be all required, or a mix of required and optional credits.

OAC

Ontario Academic Course. A prescriptive, provincially designed university entrance course.

Ombuds Service

An independent service which investigates individuals' grievances or complaints, reports findings and helps to achieve equitable settlements.

Option

An addition to a degree which a student may choose to undertake. Pursuing the option does not affect eligibility for the degree since the remainder of the course pattern(s) will be constant. That is, a student may complete the degree with or without taking the option; a student in the option may drop it and still receive the degree. The most common form of Option at Carleton at the moment is the Co-Op Option: students in the Option generally take the same academic courses as all other students, but they add Co-Op placements to their regular academic requirements.

Part-Time Student

A student who is registered in fewer than 4.0 credits or the equivalent during any academic session.

B.A. Degree Program

A university program in the Faculty of Arts and Social Sciences and the Faculty of Public Affairs and Management, normally requiring three years or 15.0 full-credits or their equivalent to achieve the degree.

Preclusion

A course that when successfully completed prevents a student receiving credit for another course because of the similarity or overlap in material. e.g. Business 42.171 ★ - "Precludes credit for Business 42.210 ★."

Prerequisite(s)

A course or courses that must be successfully completed before the student can register for the course described. In most cases, for example, the student must have taken a 100-level course in a particular discipline before being admitted to a course in the same discipline at the 200- or 300-level. The 100-level course is, therefore, a prerequisite.

Professional Development Course

A non-credit course, seminar or workshop offered through the Carleton Professional Development Centre. These courses, seminars and workshops carry no credit towards a university degree program and are not provincially funded.

Program

A group of approved courses, generally a combination of required and optional (elective) courses, which leads to a degree or certificate.

Program Year

Progress through a degree program is normally measured in terms of program years. Years are traditionally classified as First year, Second year, and so on. Progression from one year to the next is determined either by the accumulation of credits or the completion of required patterns of credits.

Public Affairs and Management

The Faculty of Public Affairs and Management comprises those academic units listed on p. 105.

Registration

The process of selecting, enrolling in, and remitting fees for courses for an academic session.

Scholarship

A monetary award based on academic achievement.

Special Student

A student not admitted to a degree program but registered in degree-credit courses to: qualify for admission, to improve professional or vocational qualifications, for transfer credit to another institution, or for personal interest.

Stream

In the Division of Engineering and Science, a way of completing a degree that requires students to commit to certain courses or course patterns within the Major Discipline. These students may take core or foundation courses in common with all other students, but once they have committed to a Stream within the program they are bound to follow a specified sub-set of courses in order to be certified as having completed that particular Stream. A current example of a Stream would be the Aerospace Stream in Mechanical and Aerospace Engineering.

Thematic Major

A program that combines the courses of two or more academic units, usually under the auspices of a Committee of Management or similar administrative structure. The best current examples at Carleton are Criminology and Criminal Justice, and Women's Studies, both of which rely on courses from several Departments.

Transfer Credit

Credit given for work done at another institution which may be granted for work completed prior to admission or during degree studies by means of a Letter of Permission.

Tuition Fees

Those fees assessed at registration for costs related to courses to be taken in the academic session. Tuition fees include laboratory and survey camps, where applicable. In addition compulsory miscellaneous fees are also assessed.

Undergraduate Student

A university student working towards a bachelor's degree.

Withdrawal

The formal procedure, according to regulations laid down by the University, of withdrawing from a course or courses, or from the University.

The Academic Year

Undergraduate Studies

- The following schedule contains the dates prescribed by the University Senate for academic activities. Dates relating to fee payment, cancellation of course selections, late charges, and other fees or charges will be published in the Important Dates and Deadlines section of the 1999-2000 *Registration Instructions and Class Schedule* booklet.
- The academic year is divided into two sessions.

Fall/Winter Session

- The Fall/Winter session commences in September and continues until the end of the examination period in April. The Fall term of the Fall/Winter session consists of the months September to December. The Winter term consists of the months January to April. Courses are offered during the Day and the Evening.

Summer Session

- The Summer session commences in May and continues until the end of the examination period in August. The First term of the Summer session commences in mid-May and continues until the end of June. The Second term commences in July and continues until mid-August. Courses are offered during the Day and the Evening.

Fall/Winter Session 1999 - 2000

September 1

- Last day for receipt of applications from potential Fall graduates.

September 4

- Fall term begins.

September 4 - 11

- PrepWeek. Academic and social orientation to the campus.

September 6

- Statutory holiday, University closed.
- PrepWeek activities continue.

September 7 - 8

- Academic Orientation. **All students are expected to be on campus.** Class and laboratory preparations, departmental introductions for students, and other academic preparation activities will be held.

September 8

- Orientation for Teaching Assistants.

September 9

- Fall and Fall/Winter classes begin.

September 24

- Last day for registration.
- Last day to change courses or sections for Fall/Winter and Fall-term courses.

September 30

- Last day for receipt of applications for review of final grades in Summer Session courses.

October 8

- University Day at Carleton. Undergraduate classes suspended.

October 11

- Statutory holiday, University closed.

October 23

- Summer-session deferred final examinations will be held.

November 5

- Last day to withdraw from Fall-term courses.
- Last day to submit, to the Paul Menton Centre for Students with Disabilities, Formal Examination Accommodation Forms for December examinations.

November 15

- Last day for receipt of applications for admission to a degree program for the winter-term of the 1999/2000 Fall/Winter session ("January Admissions").

November 21

- Fall convocation for the conferring of degrees.

December 1

- Last day for receipt of applications from potential Winter (February) graduates

December 6

- Last day of Fall-term classes.
- Fall Term ends.
- Last day for receipt of applications for degree program transfers for Winter term of Fall/Winter session.
- Last day for handing in term assignments for Fall-term courses, subject to any earlier course deadline.

December 9 - 22

- Final examinations in Fall term courses and mid-term examinations in Fall/Winter courses will be held. **It may be necessary to schedule examinations during the day for classes held in the evening and vice versa.**

January 5

- Winter term and Winter-term classes begin.

January 18

- Last day for registration for Winter-term courses.
- Last day to change courses or sections for Winter-term courses.

January 30

- Last day for receipt of applications for review of final grades in Fall-term courses.

February 1

- Last day for receipt of applications from potential Spring graduates.
- Last day for receipt of applications for admission to the Bachelor of Architectural Studies and the Bachelor of Social Work degree programs for the 2000/2001 Fall/Winter session.

February 21 - 25

- Winter Break, classes suspended.
- Fall-term deferred final examinations will be held.

March 1

- Last day for receipt of applications to the Bachelor of Music degree program for the 2000/2001 Fall/Winter session.

March 10

- Last day to withdraw from Fall/Winter and Winter-term courses.
- Last day to submit, to the Paul Menton Centre for Students with Disabilities, Formal Examination Accommodation Forms for April examinations.

April 1

- Last day for receipt of applications for admission to a program (except Bachelor of Architectural Studies, Bachelor of Music, and Bachelor of Social Work), for the 2000/2001 Fall/Winter session, from candidates whose documents originate outside Canada or the United States.
- Last day for receipt of applications for admission to the Bachelor of Humanities program for the 2000/2001 Fall/Winter session.

April 4

- Last day of Fall/Winter and Winter-term classes.
- Some lectures, laboratories, review tutorials, etc. may take place in Review Week until the end of Winter term on April 7.

April 5 - 7

- Review Week.
- Some lectures, laboratories, review tutorials, etc. may take place.

April 7

- Winter term ends.

April 10

- Last day for handing in term assignments, subject to any earlier course deadline.

April 10 to 29

- Final examinations will be held. **It may be necessary to schedule examinations during the day for classes held in the evening and vice versa.**

April 21

- Statutory holiday, University closed

May 1

- Last day for receipt of applications for admission to the Bachelor of Journalism program for the 2000/2001 Fall/Winter session.

June 1

- Last day for receipt of applications for admission to a program (except Bachelor of Architectural Studies, Bachelor of Journalism, Bachelor of Music and Bachelor of Social Work) for the 2000/2001 Fall/Winter session from mature applicants, from those presenting post-secondary education qualifications and from those transferring from other universities in Canada or the United States.
- Last day for receipt of applications for admission to a program (except Bachelor of Architectural Studies, Bachelor of Journalism, Bachelor of Music and Bachelor of Social Work) from applicants with high school qualifications from Canada or the United States.

June

- Spring convocation for the conferring of degrees, date to be announced.

June 15 - 27

- Fall/Winter term and Winter term deferred final examinations will be held.

June 30

- Last day for receipt of applications for review of final grades in Fall/Winter and Winter-term courses.
- Last day for receipt of applications for internal degree transfers to allow for registration for the 2000/2001 Fall/Winter session.

Summer Session 2000**March 1, 2000**

- Last day for receipt of applications for admission to a degree program for the 2000 Summer session.

May 1

- Last day for receipt of applications for degree program transfers for the 2000 Summer session.

May 17

- Full-session and First-term courses begin.

May 22

- Statutory holiday, University closed.
- Missed classes may meet May 26.

May 25

- Last day for registration and course changes for First-term and full-session courses.

June 9

- Last day to withdraw from First-term courses.
- Last day to submit, to the Paul Menton Centre for Students with Disabilities, Formal Examination Accommodation Forms for June examinations.

June 27

- Last day of classes for First-term. (Note: Full-session classes resume July 4.)
- Last day for handing in term assignments, subject to any earlier course deadline.

June 28 - 30

- First-term final examinations will be held. **It may be necessary to schedule examinations during the day for classes held in the evening and vice versa.**

July 3

- Statutory holiday, University closed.
- Missed classes may meet July 14.

July 4

- Second-term courses begin.

July 10

- Last day for registration and course changes for Second-term courses.

July 28

- Last day to withdraw from full-session and Second-term courses.
- Last day to submit, to the Paul Menton Centre for Students with Disabilities, Formal Examination Accommodation Forms for August examinations.

August 7

- Civic holiday, University closed.
- Missed classes may meet August 11.

August 11

- Last day of Summer-session classes.
- Last day for handing in term assignments, subject to any earlier course deadline.

August 12 - 16

- Summer-session examinations will be held. **It may be necessary to schedule examinations during the day for classes held in the evening and vice versa.**

September 30

- Last day for receipt of applications for review of final grades in Summer-Session courses.

October 21

- Summer-session deferred final examinations will be held.

1999

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2000

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Miscellaneous Information

The Organization of the University

During the 1996-97 and 1997-98 academic year, Carleton University underwent a series of changes to its academic administrative structures. Beginning in July 1997, the University now has two Academic Divisions: (1) the Division of Arts and Social Sciences and (2) the Division of Engineering and Science. The Division of Arts and Social Sciences comprises a Faculty of Arts and Social Sciences and a Faculty of Public Affairs and Management. The Division of Engineering and Science comprises a Faculty of Engineering, a Faculty of Science, a School of Architecture, a School of Computer Science, a School of Industrial Design and a School of Mathematics and Statistics. At the graduate level, there is a Faculty of Graduate Studies and Research that is responsible for all graduate programs in the University.

Here are the administrative affiliations of all academic units:

Faculty of Arts and Social Sciences: Art and Culture; Canadian Studies; Comparative Literary Studies (graduate program only); English Language and Literature; French; Geography and Environmental Studies; History; Humanities; Interdisciplinary Studies; Linguistics and Applied Language Studies; Philosophy; Psychology; Sociology/Anthropology; Women's Studies.

Faculty of Engineering and Design: Civil and Environmental Engineering; Electronics; Mechanical and Aerospace Engineering; Systems and Computer Engineering. Architecture. Industrial Design.

Faculty of Public Affairs and Management: Business; European and Russian Studies; Economics; International Affairs (graduate program only); Journalism and Communication; Law; Political Economy (graduate program only); Political Science; Public Administration; Social Work

Faculty of Science: College of Natural Sciences: Biochemistry; Biology; Chemistry; Earth Sciences; Environmental Science; Physics; Neuroscience. Computer Science. Mathematics and Statistics.

The University's Faculty of Graduate Studies and Research offers programs leading to degrees in Master of Arts, Master of Journalism, Master of Science, Master of Engineering, Master of Social Work, Master of Computer Science, Master of Management Studies, and Doctor of Philosophy studies in various fields. It also offers a program leading to a Graduate Diploma in Public Administration.

How to Use the Calendar

For ease of use, this Calendar is divided into four sections: The University; The Faculties; The Academic Units, Programs and Courses; and General Information. The items in the Table of Contents (p. 2) are arranged alphabetically within each section, and the Index can be used to find specific information within these sections.

The Calendar is also available on the Internet. The electronic version is normally available within two months after the publication of the print version (i.e. by June 1). Earlier versions – back to 1993-94 – are also available. These electronic versions can be accessed at <http://www.carleton.ca> (under the Admissions, Programs and Courses option). Care is taken to see that this Calendar accurately reflects the decisions taken by the Senate and the Board of Governors of Carleton University; but if there is a discrepancy between this Calendar and the Minutes of such decisions, the Minutes shall be considered to be the University's official statement.

Students at Carleton are governed by regulations at the University level, at the Faculty level, and at the level of their academic unit. Most academic units share common Faculty regulations with others, and to note which Faculty a particular unit belongs to, this Calendar lists the Faculty affiliation, in parentheses, under the name of the unit, on the first page of its section. Where a unit offers degrees in two Faculties, both Faculties are listed.

Three units – Architecture, Computer Science, and Industrial Design – have unique regulations, and so no Faculty affiliation is shown for them. These three units have administrative connections to the Faculties (Architecture and Industrial Design to the Faculty of Engineering, and Computer Science and Mathematics and Statistics to the Faculty of Science), but their regulations are self-contained; students enrolled in these units are still subject to general University regulations.

Administration of Regulations

Students are responsible for ensuring that the courses in which they register conform to the requirements of their academic program. The regulations published in this Calendar include the main legislation governing admission, standing and graduation for undergraduate study as approved by the Senate. Advice on more specific rules or interpretations that may affect a student's academic status is available from departmental and Registrarial Services offices.

Students have the right to appeal the application of a regulation, and should enquire about procedures at the appropriate Registrarial Services office.

Registrarial Services

Registrarial services are available to students through the following offices:

New Applicants and Prospective Students

Undergraduate Recruitment Office
315 Robertson Hall
Telephone: 520-3663

Current Undergraduate Degree and Certificate Students

Faculty of Arts and Social Sciences
318 Paterson Hall
Student Records: 520-7460
Advising: 520-7462

Faculty of Public Affairs and Management
D382 Loeb Building
Student Records and Advising: 520-3902

Faculty of Engineering and Design
(including Architecture and Industrial Design)
2090 Minto Case Building
Telephone: 520-5668

Faculty of Science
(including Computer Science)
2201 Herzberg Laboratories
Telephone: 520-4440

Special Students

School of Continuing Education
302 Robertson Hall
Telephone: 520-3500

Classification of Students

For purposes of studying at Carleton University and for the administration of regulations governing these studies, the following student classifications are recognized.

Full-Time Undergraduate Student

A student who is registered in a minimum of 4.0 credits during the Fall/Winter session, or a minimum of 2.0 credits in the Summer session.

Part-Time Undergraduate Student

A student who is registered in fewer than 4.0 credits during the Fall/Winter session, or fewer than 2.0 credits in the Summer session.

Special Student

A student who is registered in a degree-credit course or courses but who has not been formally admitted to an undergraduate program.

Professional Development Student

A student who is registered in a professional development course, seminar or workshop.

Type of Instruction

Carleton University courses use many different types of instruction. A course may use more than one of the various types of instruction. The types of instruction - using the abbreviations - are indicated in the Class Schedule booklet.

The various Types of Instruction are:

Film Screening (FLM)
Discussion Group (GRP)
Laboratory (LAB)
Lecture (LECT)
Seminar (SEM)
Studio (STU)
Tutorial (TUT)
Workshop (WKS)

Students can expect to have courses in their programs of study which use any type of instruction. In addition students can expect to have classes and/or examinations on campus scheduled any time between 08:30 and 22:00. In this regard attention is drawn to the statement regarding examinations (see p. 48 for a fuller statement):

It may be necessary to schedule mid-year and final examinations for classes held in the evening during the day and vice versa.

Senior Citizens: Tuition Fees

All persons 60 years of age and over as of the last day for late registration may register in degree-credit courses and have their tuition fees waived. The only charge to these students is a \$5.00 per session registration fee, plus Accident/Sickness Insurance charge (applicable to full-time studies).

Smoking Policy

All academic and administrative buildings are smoke-free. Smoking is allowed only in the specified sections of the University Centre, Commons Building and residences.

Other Calendars

Graduate Studies Calendar

Available from:

Dean of Graduate Studies and Research
1512 Dunton Tower
Carleton University
1125 Colonel By Drive
Ottawa, Ontario, Canada K1S 5B6

Summer Session Supplement

Available from:

Continuing Education
302 Robertson Hall
Carleton University
1125 Colonel By Drive
Ottawa, Ontario, Canada K1S 5B6

Professional and Career Development Catalogue

Directory of Courses Available from:

Continuing Education
302 Robertson Hall
Carleton University
1125 Colonel By Drive Ottawa, Ontario, Canada K1S 5B6

Course Designation System

Course Values

The basic unit of academic work is the full credit, which is indicated with a value of 1.0 on all records documents.

A course marked ★ is a half credit and is indicated with a value of 0.5 on all records documents.

Course Numbering Pattern

Course numbers consist of a prefix number, which indicates the department, school, or committee under whose auspices the course is offered, and a suffix number, which indicates the year of study in which the course is usually taken. When the suffix number of an individual course is changed from one year to the next, the old number is noted, for one year only, in parentheses next to the new number in the appropriate "Courses Offered" list.

Prefix Numbering

01 First-Year Seminars
02 Humanities
03 Interdisciplinary Social Sciences
04 Interdisciplinary Arts and Social Sciences
07 Cognitive Science
08 Art and Culture
09 Women's Studies
10 Interdisciplinary Arts
11 Art History
12 Canadian Studies
13 Classical Civilization
14 Classics
15 Greek
16 Latin
17 Comparative Literary Studies
18 English Language and Literature
19 Film Studies
20 French
21 English as a Second Language
22 German
23 Applied Language Studies
24 History
26 Italian
27 Mass Communication
28 Journalism
29 Linguistics and Applied Language Studies
30 Music
32 Philosophy
34 Religion
36 Russian
38 Spanish
42 Business
43 Economics
44 Political Economy
45 Geography
46 International Affairs
47 Political Science
48 Criminology and Criminal Justice
49 Psychology
50 Public Administration
51 Law
52 Social Work
53 Sociology
54 Anthropology
55 European and Russian Studies
56 Sociology-Anthropology

57 Environmental Studies
58 Public Affairs and Policy Management
59 Multidisciplinary Technology, Society, Environment
60 Interdisciplinary Science
61 Biology
62 Environmental Science
63 Biochemistry
64 Integrated Science Studies
65 Chemistry
67 Geology
68 Computational Sciences
69 Mathematics (Majors)
70 Mathematics (Honours)
75 Physics
76 Architecture
77 Architecture
78 Architecture
79 Architecture
80 Architecture Design
81 Environmental Engineering
82 Civil Engineering
85 Industrial Design
86 Mechanical and Aerospace Engineering
87 Aerospace Engineering
88 Mechanical Engineering
90 Engineering, Concentration in Management
91 Engineering, Common Core
93 Information and Systems Science
94 Systems and Computer Engineering
95 Computer Science
97 Electronics
99 Engineering Projects

Suffix Numbering

001-099
Courses usually taken in Qualifying-University year
100-199
Courses usually taken in First-year
200-299
Courses usually taken in Second-year
300-399
Courses usually taken in Third-year
400-499
Courses usually taken in Fourth-year (Fourth- and Fifth-year Architecture)
500-699
Courses usually taken by Graduate students

Graduate Studies and Research

Programs of graduate study, first offered at Carleton in 1954, provide opportunities for advanced study, research and critical scholarship in a number of disciplines. Carleton's libraries, laboratories and other research facilities enable graduate students to perform scholarly work of consistently high calibre, and help to foster a spirit of independent investigation.

The location of Carleton University and the University of Ottawa enables graduate students to take advantage of the research facilities connected with many national institutions and government departments.

Carleton University and the University of Ottawa have developed a number of joint and collaborative programs at the graduate level. The details of these programs are given under the appropriate academic unit in the Graduate Calendar.

Where formal joint programs do not exist, a graduate student may be permitted to follow up to two full courses at the University of Ottawa. Moreover, there are reciprocal arrangements worked out among departments, institutes and schools at both universities to involve students, when it is desirable, in parts of the program of research and studies at the other institution. All interested students should consult the Chair/Director of their department, institute or school, prior to registration, in order to obtain further information on particular departmental conditions of eligibility and procedures.

Graduate programs currently offered at Carleton are the following:

Certificate in Conflict Resolution

Certificate in Health and Social Policy in Development

Graduate Diploma in Public Administration (D.P.A.)

Master of Architecture (M.Arch.)

Master of Arts (M.A.)

Anthropology, Applied Language Studies, Canadian Art History, Canadian Studies, Communication, Comparative Literary Studies, Economics, English, European and Russian Studies, Film Studies, French, Geography, History, International Affairs, Legal Studies, Philosophy, Political Economy, Political Science, Psychology, Public Administration, Religion, and Sociology.

Master of Computer Science (M.C.S.)

Master of Engineering (M.Eng.)

Aerospace, Civil, Electrical, Materials, Mechanical Engineering, and Telecommunications Technology Management.

Master of Journalism (M.J.)

Master of Management Studies (M.M.S.)

Master of Science (M.Sc.)

Biology, Chemistry, Earth Sciences, Information and Systems Science, Mathematics, and Physics.

Master of Social Work (M.S.W.)

Doctor of Philosophy (Ph.D.)

Biology, Chemistry, Cognitive Science, Comparative Literary Studies, Communication, Computer Science, Earth Sciences, Economics, Engineering (Aerospace, Civil, Electrical, and Mechanical), Geography, History, Management, Mathematics, Physics, Political Science, Psychology, Public Policy and Sociology.

Joint programs with the University of Ottawa are offered in the following areas: Civil Engineering, Electrical Engineering, Mechanical and Aerospace Engineering, Biology, Chemistry, Computer Science, Earth Sciences, Mathematics and Statistics, Physics, and Economics.

The Institute of Neuroscience collaborates with the University of Ottawa to offer a Specialization in Neuroscience.

The Departments of Biology and Chemistry offer a collaborative program in Chemical and Environmental Toxicology.

The Ottawa-Carleton Institute of Mathematics and Statistics and the Department of Epidemiology and Community Studies at the University of Ottawa collaborate to offer a Specialization in Biostatistics.

The Ottawa-Carleton Institute of Computer Science and the Department of Systems and Computer Engineering participate with ConGESE (Consortium for Graduate Education in Software Engineering) to offer a Specialization in Software Engineering.

The Norman Paterson School of International Affairs and the Common Law Section of the Faculty of Law at the University of Ottawa offer a joint Master of Arts in International Affairs and Bachelor of Laws degree (M.A./J.L.B.).

Research

Organized research units conduct research in such fields as heritage conservation, statistics and probability, intelligent systems, women and work, media and communications, earthquake engineering, environmental impact assessment, and telecommunications technology management.

In addition, many interesting research projects are thriving, which are outlined in the biennial publication *Research and Studies*, available from the Office of Research Services, Carleton University, 1125 Colonel By Drive, Ottawa, Canada K1S 5B6.

Research and Studies is also available on-line at: <http://www.carleton.ca>

Special Students

Students interested in pursuing graduate studies at Carleton are urged to note the following University regulation: a candidate who has completed courses as a Special student is not normally permitted to transfer such courses for degree credit in the Faculty of Graduate Studies and Research.

Graduate Studies and Research Calendar and Information

The studies of each candidate will be directed by a department, institute, or school, and are governed by the general regulations outlined in the Graduate Calendar of the Faculty of Graduate Studies and Research. To obtain further information on graduate studies, contact the Graduate Supervisor of the individual unit concerned, or:

Faculty of Graduate Studies and Research
Carleton University
1125 Colonel By Drive,
Ottawa, Ontario, Canada K1S 5B6
Telephone: (613) 520-2525
Fax: (613) 520-4049.

The *Graduate Calendar* is also available on-line at: <http://www.carleton.ca>

University Office Guide

Administrative Offices

Academic Records

Transcripts, certifications of enrolment or graduation, and assistance with the touch-tone registration system.

Monday to Friday, 9:00 a.m. - 5:00 p.m.

405 Robertson Hall

520-3607

520-3606 (transcripts)

520-3666 (Touchtone Help Line)

Admissions

Information and applications for all undergraduate programs, calendars, tours, high school liaison.

Monday to Friday, 9:00 a.m. - 5:00 p.m.

315 Robertson Hall

520-3663

520-4455 (TDD service)

520-3847 (fax)

1-888-354-4414 (toll free in Canada)

Athletics

Swimming pool, fitness centre, weight rooms, intramural and varsity sports, fitness classes, fitness testing and lessons.

520-4480 (athletics office)

520-5655 (tuck shop - squash and tennis bookings)

520-5631 (recorded information message)

Awards Office

OSAP, Canada Student Loans, emergency loans, bursaries, scholarships, financial counselling.

Monday to Friday, 10:30 a.m. - 4:30 p.m. (walk-in)

9:00 a.m. - 5:00 p.m. (phone-in)

202 Robertson Hall

520-3600

520-3560 (fax)

Board of Governors

607 Robertson Hall

520-3811

520-3731 (fax)

Bookstore

University textbooks, stationery supplies, magazines, Carleton merchandise, special orders.

The following hours are subject to change:

Monday to Thursday, 9:00 a.m. - 7:00 p.m.

Friday, 9:00 a.m. - 4:30 p.m.

Third floor, Southam Hall

520-3832

Business Office

Monday to Friday, 9:00 a.m. - 4:00 p.m.

Third floor, Robertson Hall

520-3626

Campus Card Office

New, lost or replacement student cards.

Monday to Friday, 8:30 a.m. - noon, 1:00 - 4:30 p.m.

Monday and Thursday evenings, 5:00 - 7:00 p.m.

107 Robertson Hall

520-3547

Career Services

Carleton's focal point for career and employment counselling, planning and employment postings. Services include: career workshops, postings for full/part time and summer jobs; coordination of on-campus recruitment programs, career resource centre, Alumni referral services, job search information, library of calendars from Canadian, U.S. and foreign universities.

Monday to Friday, 9:00 a.m. - 5:00 p.m.

508 University Centre

520-6611

Carleton University Students' Association (CUSA)

Student services such as: a binding service, auxiliary health insurance plan, student handbook, Clubs and Societies Lounge, Off-Campus Students' Lounge, Foot Patrol, Photo Centre, International Students' Centre, Womyn's Centre, Volunteer Centre, Gay, Lesbian, Bisexual and Transgendered Centre, Bill Ellis Centre for Mature and Part-time Students, Disability Awareness Centre, Unicentre Store, Rooster's, Oliver's, funding for The Charlatan, Ombuds Services and Information Carleton.

Monday to Thursday, 8:30 a.m. - 6:00 p.m.

Fridays, 8:30 a.m. - 4:30 p.m.

401 University Centre

520-6688

520-3704 (fax)

Continuing Education

Registrar's office for all Special students, information on instructional television courses, calendars for non-degree students.

Monday to Friday, 9:00 a.m. - 5:00 p.m.

Monday to Thursday evenings, 5:30 - 7:30 p.m.

302 Robertson Hall

520-3500

520-3502 (fax)

Development and Alumni Services

Secures funding for the University to support the library, student aid, and other specific projects. Administers the Alumni Association which sponsors reunions and an alumni award program, assists branches and chapters to organize various activities, produces the Carleton University Magazine three times a year.

510 Robertson Hall

520-3636

520-3587 (fax)

Health and Counselling Services

Medical appointments, walk-in service, mental health counselling, health and nutrition information.

Monday to Friday, 9:00 a.m. - 6:00 p.m.

2600 Carleton Technology and Training Centre

520-6674

520-4059 (fax)

Housing and Food Services

Information about residence accommodation, off-campus housing, and food services and meal plans.

Monday to Friday, 9:00 a.m. - 5:00 p.m.

University Office Guide

261 Stormont House
520-5612 (residence accommodation)
520-5614 (off-campus accommodation)
520-3952 (fax for both)

Information Carleton

General enquiries on University services, facilities and programs; University phone numbers, office hours and locations; events, schedules, meal plan service.

The following hours are subject to change:

Monday to Thursday, 8:30 a.m. - 6:30 p.m.

Friday 8:30 a.m. - 5:00 p.m.

Fourth floor, University Centre

520-7400

520-6620 (TDD service)

520-7455 (fax)

E-mail: infocarleton@ccs.carleton.ca

Instructional Television (itv)

Serving students both on and off campus, courses are offered through cable and video cassette distribution from four undergraduate faculties during the Fall, Winter, and Summer terms.

302 Robertson Hall

520-3500 (course information)

520-2600, ext. 8560 (distribution)

520-4042 (Tapes-to-You)

520-4456 (fax)

520-2600 ext. 7609 (Tape Loan Service, D299 Loeb)

Lost and Found

Information Carleton

Fourth floor, University Centre

520-7400

E-mail: infocarleton@ccs.carleton.ca

MacOdrum Library

Main University library, extensive reference and government documents sections, on-line library catalogue (CUBE), CD-ROM and on-line literature searching, student microcomputer rooms, access to campus network services, tours and reference/research assistance, reserve readings for courses, and photocopying centre.

Fall/Winter Terms

Monday to Friday, 8:00 a.m. - 11:00 p.m.

Saturday and Sunday, 10:00 a.m. - 11:00 p.m.

Spring/Summer Intersessions

Monday to Friday, 9:00 a.m. - 5:00 p.m.

Saturday and Sunday - closed

Summer Term

Monday to Thursday 8:30 a.m. - 10:00 p.m.

Friday 8:30 a.m. - 5:00 p.m.

Saturday - closed

Sunday - 12:00 p.m. - 5:00 p.m.

The Library closes for all holidays except Good Friday and Easter Monday.

These hours are subject to change.

520-5621 (library hours - recording)

520-2735 (information/reference desk)

520-2734 (circulation)

520-2750 (fax)

Paul Menton Centre for Persons with Disabilities

The Centre provides individualized support services to students with documented disabilities. These services include, but are not limited to, in-class notetakers, academic accommodations,

counselling support, transcription services and access to adaptive technology. The University also provides a 24-hour Residence Attendant Services Program.

500 University Centre

520-6608

520-3937 (TDD service)

520-3995 (fax)

<http://www.carleton.ca/~pmc>

President's Office

601 Robertson Hall

520-3801

520-4474 (fax)

Professional Development Programs

810 Dunton Tower

520-3488

WWW address: www.business.carleton.ca/profdev

Registrars' Offices

Information and assistance for degree students on all academic regulations, declaration (change of major/honours), late withdrawals, petitions, changes of address, letters of permission and academic audits.

Arts and Social Sciences

318 Paterson Hall

520-7460

520-3713 (fax)

Continuing Education

Special Students

302 Robertson Hall

520-3500

520-4456 (fax)

Engineering and Design

2090 Minto Centre

520-5668

520-5682 (fax)

Public Affairs and Management

D382 Loeb Building

520-3902

520-2392 (fax)

Science

2201 Herzberg Laboratories

520-4440

520-4389 (fax)

Senate Office

607 Robertson Hall

520-4478

520-2689 (fax)

Student Life Services

Student Life Services offers a wide range of programs and services to assist students in their adjustment to academic life, in improving their learning skills, and in making decisions with regard to academic and career concerns. Student Life Services is also responsible for Career Services and the Paul Menton Centre for Persons with Disabilities.

Monday to Friday, 9:00 a.m. - 5:00 p.m.

501 University Centre

520-6600

University Hours of Operation

Winter Hours

Labour Day - April 30

Office hours are Monday to Friday, 9:00 a.m. - 5:00 p.m.

Summer Hours

May 1 - Labour Day

Office hours are Monday to Friday, 8:30 a.m. - 4:30 p.m.

Most University offices are closed for lunch between 12 noon and 1:00 p.m.

Some offices keep evening hours:

Information Carleton

Monday to Thursday

8:30 a.m. - 6:30 p.m.

Continuing Education

Monday to Thursday

6:30 - 8:30 p.m.

Bookstore

Monday to Thursday

9:00 a.m. - 7:00 p.m.

The library, some cafeterias, and the athletics complex are open in the evenings.

Academic Departments

Aboriginal Studies: see Institute for Interdisciplinary Studies

Accounting: see Business, School of Aerospace Engineering: 3135 Mackenzie Building, 520-5684

African Studies: see Institute for Interdisciplinary Studies

Anthropology: see Sociology-Anthropology

Architecture, School of: 202 Architecture Building, 520-2855

Art and Culture, School for Studies in: 423 St. Patrick's Building, 520-3993

Art History: 423A St. Patrick's Building, 520-2342

Asian Studies: see Institute for Interdisciplinary Studies

Biochemistry, Institute of: 203 Steacie Building, 520-3523

Biology: 587 Tory Building, 520-3888

Business, School of: 710 Dunton Tower, 520-2388

Canadian Studies, School of: 1206 Dunton Tower, 520-2366

Chemistry: 203 Steacie Building, 520-3841

Child Studies: 2216 Dunton Tower, 520-2368

Civil and Environmental Engineering: 3432 Mackenzie Building, 520-5784

Cognitive Science: 2216 Dunton Tower, 520-2368

Comparative Literary Studies, School for: 1701 Dunton Tower, 520-2177

Computer Science, School of: 5302 Herzberg Laboratories, 520-4333

Criminology and Criminal Justice: D485 Loeb Building, 520-2588

Directed Interdisciplinary Studies: see Institute for Interdisciplinary Studies

Earth Sciences: 304 Tory Building, 520-4400

Economics: C876 Loeb Building, 520-3744

Electronics: 5170 Mackenzie Building, 520-5754

English Language and Literature: 1812 Dunton Tower, 520-2310

English as a Second Language: 215 Paterson Hall, 520-6613

Environmental Science: 2269 Herzberg Laboratories, 520-3859

Environmental Studies: B433C Loeb, 520-2600 ext. 8370

European and Russian Studies, Institute of: 3A59 Paterson Hall, 520-2888

Film Studies: 423 St. Patrick's Building, 520-5606

French: 1602 Dunton Tower, 520-2168

Geography: B349 Loeb Building, 520-2561

History: 400 Paterson Hall, 520-2828

Humanities, College of the: 300 Paterson Hall, 520-2809

Industrial Design, School of: 3470 Mackenzie Building, 520-5672

Integrated Science Studies: 2279 Herzberg Laboratories, 520-3890

Interdisciplinary Studies, Institute for: 2216 Dunton Tower, 520-2368

International Affairs, Norman Paterson School of: 2A55 Paterson Hall, 520-6655

Journalism and Communication, School of: 346 St. Patrick's Building 520-7404

Labour Studies: see Institute for Interdisciplinary Studies

Latin American and Caribbean Studies: see Institute for Interdisciplinary Studies

Law: C473 Loeb Building, 520-3690

Law Enforcement Studies: D485, Loeb Building 520-2588

Linguistics and Applied Language Studies, School of: 215 Paterson Hall, 520-2802

Mass Communication: 310 St. Patrick's Building, 520-7408

Mathematics and Statistics: 4302 Herzberg Laboratories, 520-2155

Mechanical and Aerospace Engineering: 3135 Mackenzie Building, 520-5684

Medieval Studies: see Institute for Interdisciplinary Studies

Music: A911 Loeb Building, 520-5770

Philosophy: 2123 Dunton Tower, 520-2110

Physics: 3302 Herzberg Laboratories, 520-4377

Political Science: B640 Loeb Building, 520-2777

Psychology: B552 Loeb Building, 520-2644

Public Administration, School of: 1022 Dunton Tower, 520-2547

Public Affairs and Policy Management, Arthur Kroeger College of Public Affairs; Loeb Building, 520-7560

Religion: 2121 Dunton Tower, 520-2100

Social Work, School of: 509 Dunton Tower, 520-5601

Sociology-Anthropology: B750 Loeb Building, 520-2582

Systems and Computer Engineering: 4462 Mackenzie Building, 520-5740

Technology, Society, Environment Studies: 2249 Herzberg Laboratories, 520-4483

United States Studies: see Institute for Interdisciplinary Studies

Urban Studies: see Institute for Interdisciplinary Studies

Visual and Performing Arts: see School for Studies in Art and Culture

Women's Studies, Pauline Jewett Institute of: A812 Loeb Building, 520-6645

Student Services

Athletics and Recreation

Telephone: 520-4480

The mandate of the Department of Physical Recreation and Athletics is to enhance campus life, spirit, and health by providing a variety of opportunities for high-quality physical activity which meet the needs of students and staff. A balance of programs is offered for all skill and competitive levels, including freelance recreation, instruction programs, intramural sports, and interuniversity athletics.

The athletic facilities include an L-shaped fifty-metre pool with diving tower; a Fitness Centre with weight-training equipment, and cardiovascular machines; nine International squash courts; a double gymnasium; a heavy-weight training room; and Combatives and Multipurpose rooms. Outdoor facilities include football and soccer fields, three other playing fields, and five tennis courts. These facilities may be available to students either for recreational needs or for organised competition.

Instructional classes offered include group fitness programs such as aerobics, weight-training, and step aerobics; personal training services; fitness appraisals; aquatics programs such as learn-to-swim, aquafit, and masters' swim; dance; martial arts; yoga and tai chi.

For further information on varsity athletics, competitive club teams and intramurals, contact the Athletics department or visit our website at www.carleton.ca/athletics.

There is an Athletics Board which advises the Department and the University on matters of athletics and recreation policy through the Office of the President. The Board is composed of members from the Faculty, Administration, Alumni, the Students' Associations, and the Residence Association.

Awards Office

202 Robertson Hall
Telephone: 520-3600
Fax: 520-3560

Medals are the major academic awards granted by the University to its superior graduating scholars. They have no monetary value.

The Awards Office is responsible for the administration of undergraduate scholarship and bursary programs and loans for graduate and undergraduate students.

Scholarships are awarded on entry to the University and to those in course on the basis of superior academic performance. Applications are not required except for the top eight entrance scholarships.

Awards and prizes are awarded for excellence in particular areas of study. They may be cash awards or book prizes. Applications are not required.

Administration of Awards

1. Students receiving scholarships and bursaries exceeding in total \$500, and which are under the jurisdiction of the University, will ordinarily be paid in two installments, one in October and one in January. The University reserves the right to withhold the payment of the second installment in cases where students do not meet the conditions of the award. Awards of less than \$500 will ordinarily be paid in one installment, in October.

2. Scholarship and bursary recipients who withdraw before the completion of their year will be expected to refund their bursaries or scholarships (or a portion thereof).

Financial Aid for Students

Bursaries

Bursaries are awarded to students who can show genuine need of financial assistance to meet their educational expenses. Students are expected first to make use of all resources available to them and to apply for government assistance.

Recipients for bursaries will normally be selected in December of each year, but applications may be considered at other times of the year in exceptional circumstances, if funds permit. An application, available in the Awards Office, is required for bursaries that are administered by Carleton.

Government Aid Programs

Ontario Residents

Canadian citizens or permanent residents who are residents of Ontario may qualify for assistance from the Ontario Student Assistance Program. The financial aid scheme is designed to supplement, rather than replace, family and/or student resources. In order to determine the additional funds required, the province objectively assesses the resources of the family and/or the student that could reasonably be used to provide for the student's educational costs. The assistance could be in the form of a Canada Student Loan and/or Ontario Student Loan. The maximum loan a student can receive in one academic year is usually the total amount of his or her allowable educational costs. Application forms and further information can be obtained by contacting the Awards Office at Carleton or the Student Awards Branch of the Ministry of Education and Training, P.O. Box 4500, Thunder Bay, Ontario P7B 6G9.

Students wishing to have applications processed in time for Fall registration must ensure that completed forms are submitted to the Awards Office by July 1.

Residents of Other Provinces/Territories Except Quebec

Canadian citizens or permanent residents from the territories and all other provinces except Quebec may qualify for assistance from the Canada Student Loans Plan through their home province. The maximum loan available per academic year is currently \$165 a week. The loan is interest free while the student is enrolled in a 60 percent course load. Some provinces also make available non-repayable grant assistance along with this federal loan. Quebec residents should apply through the Quebec Loans & Bursaries Program.

The Awards Office disburses general information on the various provincial aid schemes but application forms and details on individual programs must be obtained from the authorities in the home province. Deadline dates vary but, generally speaking, it is wise to apply for financial assistance through the appropriate provincial department before June 30.

Part-Time Students

Solely for purposes of federal/provincial financial aid schemes (except Quebec), part-time students are classified as those enrolled in fewer than 3.0 full-credit courses. These students are advised to contact the Awards Office for information on the availability of financial aid for part-time study.

Bookstore

Telephone: 520-3832

The University Bookstore, located in Southam Hall, stocks required textbooks and offers a wide selection of scholarly and general books.

A complete line of school supplies and insignia clothing and gifts is also available.

Bookstore hours are: Monday through Thursday, 9:00 a.m. to 7:00 p.m., Friday 9:00 a.m. to 4:30 p.m. Hours are subject to seasonal changes and will be posted at the Bookstore entrance. Customers are urged to call ahead if they are not clear on the hours.

The Bookstore's refund/exchange policy requires merchandise to be returned within 48 hours of purchase. There is an extended refund period at the beginning of each term. Customers are urged to review the policy before making a purchase. The cash register receipt is required for any refund or exchange.

Career Services

508 University Centre
Telephone: 520-6611
Fax: 520-5695
Website: www.carleton.ca/career
Email: career@carleton.ca

Career Services (CS) is the on-campus career and employment centre. It provides students and alumni with the resources and materials they need to embark upon their job search. Services provided by this office include:

Resource Centre

A resource centre is available for students to research educational, employment, and career planning resources. Materials available include: occupational materials, university and community college calendars, company videos and CD Roms, job search materials, newspapers, business periodicals, occupational and labour market trends, work abroad information, salary information, an assortment of employment directories and information on various associations. Information about other sources of assistance at Carleton and in the greater Ottawa community is also available. There is a library of materials that are available on a loan system.

Career and Employment Counselling

Career and educational counselling involves learning to plan wisely, handle Difficulties, and make decisions with regard to academic and career concerns. Relevant information generated by group discussion and assessment is used in helping the student to determine goals and make choices. In addition, group workshops, dealing with employment issues, are held on a weekly basis on resume writing/cover letters, interview techniques and job search/networking skills. Register to attend by signing up with our reception staff.

Job Postings

Part time, summer and internship opportunities are posted on the self-service job boards within the office. Full time jobs are posted in job binders located in the reference library. Students may also access the Job Bank situated on the 4th floor of the Unicentre, to search for jobs posted by Human

Resources Development Canada. CS also provides computer work stations for students to access electronic job search methods such as the National Graduate Register and Campus WorkLink.

A selection of jobs advertised at Career Services appear on our homepage and in our Charlatan ad, which runs every second week during the fall and winter terms. Copies of the ad are circulated to departments on campus for posting. A detailed description of employment activity is published in our Employment Bulletin. The bulletin is posted in a glass case outside the office.

Career Fair

Career Services hosts an annual Career Fair early in October. Employers from both the private and public sectors visit the campus

to answer student inquiries and raise awareness of permanent job opportunities and career possibilities. The Career Fair date, time and location will be advertised in our September/October Charlatan ads.

Summer Job Fair

During the last week in January or first week in February, Career Services hosts a Summer Job Fair. Various employers participate in the job fair to advertise their summer employment opportunities to all students currently enrolled in full time or part time studies. The Summer Job Fair will also be advertised through the Charlatan ad.

Employment Information Events

Throughout the year, CS organizes a number of career and employment information events for students to provide them with the opportunity to gather information on various career possibilities. Some of these sessions may include on-campus visits from various employers and associations to discuss career opportunities, information sessions on government employment programs, and presentations from various representatives to provide students with information on working abroad.

On Campus Recruiting

Employers from both the private and public sectors visit Carleton University to recruit graduating students for permanent employment opportunities which are available at the end of the academic term.

Positions advertised through the program are of a professional nature. Students seeking employment through the On-Campus Recruitment Program must be in their graduating and final year of studies at Carleton University. The recruiting season takes place during both the fall and winter terms.

On-Campus Recruiting job postings are also advertised through our Charlatan ad and the Employment Bulletin.

Alumni Referral Service

The Alumni Referral Service is for new and recent Carleton graduates. It is based on informing qualified Carleton alumni, registered with our service, of immediate job openings. All positions are also posted in the full time job binders in the reference library.

Students may register for the Alumni Referral Service one month prior to completing their degree requirements and may continue to register and participate in the service for up to three years after graduation. Students do not have to be unemployed to be eligible for the service, but they must be sincerely and actively looking for a job.

Carleton University Students Association

University Centre 401
Telephone: 520-6688
Fax: 520-3704

The Carleton University Students' Association (CUSA) is an incorporated, student-run organization that promotes the interests of the student body. All registered full or part-time undergraduate students are members of CUSA.

CUSA represents the students' interests to all levels of government and administration. It is also a member of the Canadian Federation of Students (CFS) and CFS-Ontario. These two organizations are committed to bringing about necessary educational, administrative and/or legislative changes in those areas affecting students.

Student Services

Student services funded wholly or in part or operated by CUSA include: Career and Placement Services (by direct student levy); Carleton Disability Awareness Centre; Carleton Foot Patrol; Gay, Lesbian, Bisexual and Transgendered Centre; Information Carleton; International Students' Centre; Mature and Part-time Students' Centre; New University Government; Off-Campus Students' Lounge; Photo Centre; Women's Centre; and the Volunteer Centre.

CUSA business ventures include: Oliver's Pub and Patio; Rooster's Coffeeshouse; Unicentre Store; and a Canada Post outlet.

The legislative body of CUSA is a 34 member Students' Council made up of representatives from each faculty and a President and Finance Commissioner who are elected annually by the student population. Elections take place in February. The term of office is twelve months commencing the following May.

CUSA also sponsors more than 100 clubs and societies, alternate education programs, speaker series, and concerts.

The Students' Association is continually working to improve and expand its scope of activities. Students are encouraged to communicate ideas and opinions to members of their elected representatives in CUSA, to participate and become actively involved in the activities of the Association, and to exercise their voting privileges.

The Chaplaincy

Protestant-Ecumenical Chaplaincy
T28, T30 Tory Tunnel
Telephone: 520-4449

Roman Catholic Chaplaincy
127G University Centre
Telephone: 520-2896 or 520-2590
Chaplain, Father Don Maclellan
Assistant Chaplain, Deacon Derek G. Smith

For over three decades a chaplaincy service has existed at Carleton. Part of its function is to share experiences, insights, friendships and our faith. We are also involved in study and discussion groups, community projects, development education, marriage preparation and religious services. In addition, we have connections with many organizations and resources on campus as well as with churches and religious groups in the Ottawa area.

The two principal chaplains (Protestant-Ecumenical and Roman Catholic) are supported by a number of people in the Chaplaincy offices, which are open most days. Appointments are not necessary but at times they are advisable. People are encouraged to visit the offices at any time.

Next to the offices in the Tory Tunnel there is a Quiet Room, which is used for individual meditation, religious services (times posted), and prayer group activity. It is open all day, five days a week. Check with the Chaplaincy office regarding special services.

Colonel By Child-Care Centre

Telephone: 520-2715
Fax: 520-3992

Colonel By Child Care Centre has been providing non profit Child Care on the Carleton University campus for over 20 years. Qualified teachers care for 57 children between the ages of 6 months and 5 years. The Centre operates twelve months a year, Monday to Friday from 8:00 a.m. to 5:45 p.m. Fee subsidies from the Regional Municipality of Ottawa-Carleton are available for families who meet the criteria.

As there is a waiting list, parents are encouraged to apply as early as possible.

For further information, please contact Margot Henderson.

Computer Store

Telephone: 520-3699

The Computer Store, located in Southam Hall, carries a full range of computer products, (including Apple, IBM, NEC Bell, and Compaq computers, printers, modems, software and other peripherals) at very competitive prices, for students, faculty and staff.

Store hours:

Monday to Thursday

9:00 a.m. - 5:00 p.m.

Friday 9:00 a.m. - 4:30 p.m.

Closed weekends and statutory holidays.

Summer hours are posted at the entrance.

Computing and Communications Services

401 Robertson Hall
Telephone: 520-3700

A wide range of computer services are available to students. There are several Sun systems running Unix, as well as a number of microcomputer networks. All students are eligible for accounts on the CHAT system, an electronic communication system for e-mail, course discussion groups and Internet access. Also, all students have access to word processing spreadsheet and database software as well as laser printing facilities and CD-ROM services at the microcomputer labs on campus. Student Consultants are available at the microcomputer labs during peak times.

Comprehensive data analysis packages such as SAS, SPSS, Maple, Mathematica and Matlab are available for general research applications. Complete information about computing on campus is available to all students through the campus-wide information gopher see <http://www.carleton.ca/CCS>.

For information or assistance, please visit the CCS Help Desk in 401 Robertson Hall or call 520-3700. Handouts on various computing topics are available for pick up.

Equity Services

22nd Floor Dunton Tower
Director, Ingrid Wellmeier

Equity Services consists of the Centre for Aboriginal Education, Research and Culture, the Mediation Centre, the Race Equity Office and the Status of Women Office. The role of Equity Services at Carleton is to promote equity, accommodate diversity and prevent discrimination. Proactive work includes workshops on diversity, cultural sensitivity, anti-racism, conflict resolution, mediation, harassment prevention as well as research on aboriginal issues. Each office has an extensive collection of publications and up-to-date research in their respective areas. Staff mediates conflict between individuals or among groups, works to resolve complaints of harassment or discrimination and provides advice to students, staff and faculty.

The Centre for Aboriginal Education, Research and Culture

2206 Dunton Tower
Telephone: 520-2600 ex. 4500
Fax: 520-2512
Director, Armand Garnet Ruffo

The CAERC exists to ensure Aboriginal representation and presence on campus. It provides consultative services on First Nations, Metis and Inuit matters and pursues specific educational, research and cultural projects in co-operation with students, faculty, staff and the community at large.

The CAERC is also host to the Carleton First Nations student club.

The Mediation Centre

2211 Dunton Tower
Phone: 520-5765
Fax: 520-4024
E-mail: rramkay@ccs.carleton.ca

The Mediation Centre offers assistance to individuals and groups in conflict at the University. Students, staff and faculty can access the Centre for free. Training, group facilitation, mediation, conciliation, chairing of meetings, strategic planning leadership, prevention and de-escalation, team building and problem-solving facilitation, consultation and advice are available upon request from the Centre. The Mediation Centre uses a collaborative problem-solving process by which individuals and groups in conflict identify and resolve their problems with their conflicts with the help of an impartial third party who has no decision-making power. Roommate, landlord-tenant, interpersonal relationships, neighbourhood, sexual harassment, and human rights are some of the disputes handled through the Centre.

Every September, the Centre recruits volunteers among faculty, staff, students and Ottawa South residents and trains them as mediators. Please contact the Centre if you are interested in becoming a volunteer. The Centre also offers academic and teaching support and hosts an annual Symposium on Conflict Resolution in February. Please contact the Centre for more information.

Race Equity Office

2209 Dunton Tower
Telephone: 520-5645
Fax: 520-4037
Co-ordinator, Dr. Edward Osei Kwadwo Prempeh

Carleton University is host to students from various racial, cultural and ethnic backgrounds. The University has a well-established reputation for its commitment to excellence in diversity, and the Race Equity Co-ordinator works collaboratively with a wide range of students, faculty, staff and senior administrators to promote diversity as an institutional value and develop campus-wide educational programs to assist in broadening their knowledge and sensitivity to cultural and racial diversity.

The Office deals with complaints of racial discrimination and harassment and provides a confidential advisor service to complainants. The Office also offers workshops on topics such as employment and educational equity, 'chilly climate', and racism. These workshops are available to campus groups, student organizations, departments, classes, or by request.

Status of Women Office

2201 Dunton Tower
Telephone 520-5622
Fax: 520-4037
Ingrid Wellmeier

Staff in the Status of Women Office work with various committees on campus to improve women's access to education, employment and services. Assistance is provided in locating childcare, resolving harassment complaints, personal and campus safety, date rape and sexual assault, lack of accessibility, sexism, employment and education equity, and chilly climate. Services are available to all students, faculty and staff.

Health and Counselling Services

Suite 2600
Carleton Technology and Training Centre
Telephone: 520-6674

Health and Counselling Services is your wellness centre at Carleton University. The centre offers a wide range of services, including

treatment of illness, immunizations, birth control information, travel medicine information, a health education program, and much more. Our counselling services has professionally trained counsellors and psychiatrists to help with personal and emotional difficulties. All health records are confidential and will not be released to anyone without client written consent.

Our hours are from 8:30 a.m. to 4:30 p.m. (May - August) and 9:00 a.m. to 6:00 p.m. (September - April). Appointments are encouraged and may be made in person or by calling 520-6674. If you feel you need medical assistance before an available appointment, please feel free to walk in and a member of our health care team will make an initial assessment and direct further care as needed.

After-hours medical services are available from Holland-Carling After Hours Clinic located at 476 Holland Ave., (at Carling), phone 722-9689. When you call to book an appointment please identify yourself as a Carleton student.

Psychiatrists are available on a referral basis for those requiring psychiatric assessment or care. The services provided are available to all students of the University, and are covered by provincial health insurance.

Counsellors are available to see students on a self-referral basis. Along with regular counselling appointments, our counselling staff offers "drop-in" times daily, for students needing short but immediate contact with a counsellor. Personal counselling can help individuals deal more effectively with emotional and social concerns.

A Health Education Program, promoting healthy lifestyles and wellness, offers on-going workshops presented by trained student peer educators. Topics include, but are not limited to, nutrition, alcohol, sexuality, stress management and smoking cessation. For more information, call the Health Educator at 520-6676.

Health Insurance

1. Ontario Students

Carry your health insurance number with you at all times. If you do not have one, application for coverage must be made directly with the Ministry of Health at 75 Albert Street in Ottawa.

2. Students from Another Province

If you are from outside of Ontario, check that your health insurance is active and carry your number with you at all times. We don't bill you, we bill your provincial insurance plans directly.

3. Students from Outside Canada

The University Health Insurance Plan (UHIP) is compulsory for all international students upon registration. Further information regarding UHIP may be obtained from the foreign student advisor, the International Student Centre or Carleton International.

If you do not have any health insurance, you may be billed for services rendered. The University may withhold the marks of students with outstanding accounts.

Immunization Record

It is recommended that new students:

1. Check with your family physician to ensure adequate immunization. An updated tuberculin skin test is recommended.
2. Obtain documentation of vaccination to red measles, German measles, mumps, polio and tetanus from your family physician. A booster dose of measles/mumps/rubella vaccine is recommended if you have not been re-immunized since infancy.
3. Discuss Hepatitis B vaccine with your family physician. The Medical Office of Health for Ottawa-Carleton region strongly recommends it for all adolescents and young adults.

Ombuds Services

511 University Centre
Telephone: 520-6617

Jim Kennelly
University Ombudsperson

Ombuds Services deals with a variety of grievances and complaints as well as with requests for information. A few examples of the on-campus and off-campus problems include academic appeals, graduation appeals, fee disputes and human rights issues. Financing of this service is provided equally by the University and the Students' Association (CUSA).

Parking and Lockers

Telephone: 520-3623

Permission to park on the campus is granted, for a charge, to students and others associated with the University, but this permission is conditional upon co-operation in the observance of the regulations. Penalties will be imposed for infractions and, under certain circumstances, cars will be towed away at the owners' risk and expense. Security officers are authorized to issue City of Ottawa traffic tickets on campus. Fines for City of Ottawa tickets are set by the city and may vary from time to time. Any vehicle not displaying a valid Carleton Permit is subject to this type of ticket.

Examination grades will be withheld from students owing sums of money to the University. Unless cause can be shown, the third infraction may lead to withdrawal of parking privileges. The regulations related thereto are available in the Parking office. Students and staff who bring cars to the campus are expected to make themselves familiar with these regulations.

Rent is charged for the use of locker space during the academic year. Lockers are allocated on a first-come first-served basis and may be shared. Locks will be removed from lockers occupied by unauthorized persons and the contents turned over to the Parking office. A fine will be imposed when contents are released. No refunds or exchanges will be made.

Lockers must be vacated by May 1 for the Fall/Winter session and by August 20 for the Summer session, after which they will be cleared and the contents treated as abandoned and will be disposed of by the University without further notice. Lockers are not a safe space to store valuables. The University assumes no responsibility for lost, stolen or damaged articles.

Paul Menton Centre for Persons with Disabilities

500 University Centre
Telephone: 520-6608
TDD: 520-3937
Fax: 520-3995
Website: www.carleton.ca/pmc

Larry McCloskey - Associate Director, Student Life Services, responsible for the Paul Menton Centre
Nancy McIntyre - Learning Specialist / Co-ordinator, Learning Disabilities
Diane Proulx - Learning Specialist / Co-ordinator, Physical Disability Programs
Matthew Cole - Co-ordinator, Attendant Services

Academic Accommodation

Carleton University has a Senate-approved policy on Academic Accommodation (see p. 31). This policy promotes reasonable efforts to accommodate students with disabilities so that they will have the opportunity to meet learning objectives and be fairly evaluated

in their performance. The University is strongly committed to providing reasonable access and reasonable accommodation for all individuals with identified and duly assessed disabilities. In no case, however, does academic accommodation negotiate away, lower or remove the academic standards and learning objectives of any course or program at the University.

Publications

A series of brochures and flyers on resources and services available to students with disabilities at Carleton University may be obtained from the Paul Menton Centre free of charge. Information is also available on the website.

Requests for Service

The Paul Menton Centre provides individualized support services, based on appropriate and up to date documentation, to persons who are deaf or hard of hearing, with learning disabilities, attention deficit disorder (ADD), visual impairments, head injuries, physical disabilities including mobility impairments, or who have psychiatric or other medical disabilities. The Centre accommodates as many requests as resources permit.

Students are responsible for applying for special services by making an appointment with the appropriate coordinator. All requests will be considered on an individual needs basis. Students are advised to come to the Centre early in the term to discuss service requests.

Examination Accommodations

Examination accommodations for all tests and examinations (in-class, inv, or formally scheduled) must be arranged by specific deadline dates. Please refer to the Paul Menton Centre for a list of deadlines for all examinations. Accommodation requests not made prior to the specified deadlines will not be fulfilled.

Library Services for Students with Disabilities

Students referred by the Paul Menton Centre have access to the Joy Maclaren Adaptive Technology Centre, located on the main floor of the MacOdrum Library, Room 232. Heather Cross, Coordinator of Library Services for Students with Disabilities, is located in the department of Reference Services, Room 206 (520-2600, extension 8186). Students are advised to contact her for a complete list of services available in the Library including use of the Centre, research assistance, stacks retrieval, assistance with photocopying, and reserves assistance. Services at the University of Ottawa for students with disabilities are also available to Carleton students. Students must obtain a letter of referral from Heather Cross for each academic year to have access to services at the University of Ottawa.

The Joy Maclaren Adaptive Technology Centre has six workstations on which students have access to various software applications (word processing and spreadsheets), SS-Labs, CUBE, Chat Accounts, the Campus Network, large screen monitors, adjustable-height computer tables, a voice recognition system, screen magnification, screen reading and a scanner.

The Library's contact for transcription services is Margaret McLeod of the department of Reference Services (520-2600, extension 8943). Students referred by the Paul Menton Centre are registered with the W. Ross MacDonald School, the provincial agency which provides texts and other course related material in alternative formats for students with a print disability. For tapes that must be borrowed from Recordings for the Blind and Dyslexic, there is a lifetime registration fee of \$75 (U.S.) plus a \$25 (U.S.) annual fee. It is essential to obtain course outlines as early as possible, and to get your requests in early.

Students may scan text using the Reading Edge, a reading machine, and have the scanned material recorded onto audio tape or downloaded onto a disk. This machine is housed in the Joy McLaren Adaptive Technology Centre.

Assistive Technical Devices

A limited number of portable computers, two and four-track tape recorders, and personal FM systems are available for loan. Written referral by a Paul Menton Centre Coordinator is required.

Students who are Deaf or Hard of Hearing

It is the student's responsibility to initiate early enquiries. If specialized equipment or services, such as personal FM systems or sign language interpreters, are required, please contact the Centre at least a month prior to the start of classes. The Centre acts as liaison for agencies which may provide funding for various services. Early enquiries are required to arrange these services.

Students with Learning Disabilities

It is required that the student have a recent psychoeducational assessment available which has been administered after the age of 16 or within three years of initial registration at the Paul Menton Centre. This will allow Paul Menton Centre staff to organize services that address each individual's particular learning disability.

Students with Attention Deficit Disorder (ADD)

To receive accommodation, students with ADD are required to have formal identification from a psychiatrist, psychologist or physician. For further information contact the Paul Menton Centre.

Students with Mobility Impairments

The campus of Carleton University is well equipped for accommodating persons with physical disabilities. The buildings are in close proximity to each other and most are connected by tunnels. All of the main buildings have elevators and are ramped for outside entrance and egress. Most sidewalks have been made accessible by curb-cut renovations. A building-by-building accessibility inventory is available from the Centre or on the website.

Students with Non-Visible Disabilities

Students with non-visible disabilities may have legitimate needs which are not easily recognized or understood within the University community. Students with psychiatric or medical disabilities may wish to contact the Paul Menton Centre to discuss personal or academic issues of concern to them. Appropriate documentation is required.

Attendant Services Program in Residence for Students with Disabilities

The Attendant Services Program in Residence offers 24 hour assistance with activities of daily living such as personal care, room chores, cafeteria assistance, etc. The program is available to students with various levels of disability and attempts to respond to individuals according to their specific needs. In order to provide comprehensive services only a limited number of program spaces are available each year. A guide describing the program in detail is available free of charge by contacting the Attendant Services Co-ordinator at 520-6615.

For students who need an accessible room in residence but do not require attendant services, a limited number of rooms are available based on the following criteria: the need for special accommodation, level of disability, whether the applicant has housing alternatives in the area, and the date of application. For further information contact the Accommodations Officer in the Department of Housing and Food Services at 520-5612.

Student Housing and Food Services

261 Stormont House
Residences

Telephone: 520-5612

Fax: 520-3952

Email address: accommodations@carleton.ca

The staff of the Department of Housing and Food Services strive to enhance the University experience by providing support and various services to the 1,666 students living in the residence community. This includes developing and promoting programs which respond to the academic objectives and developmental needs of residence students. The live-in Residence Life staff are active in contributing to the educational, cultural, and social growth of the students in their houses.

The residences are located on campus and close to classrooms, the library, and other University facilities. The underground tunnel system makes travel to other University buildings easy in all seasons. Each residence building is provided with T.V. lounges, study areas and laundry facilities.

Students' rooms are equipped to meet the basic needs of students, including individual Ethernet access to existing computer systems at Carleton University, including CHAT and the World Wide Web. (additional cost for hook-up)

Students of the University are eligible to apply to live in residence, with first-year students with a high school leaving average of 70 percent or better being given preference. The residence contract covers the period from September through the Spring examinations, except for a short period at Christmas when the majority of the facilities are closed.

The Residence fee includes provision of a meal plan, in which all students must participate. There are three available meal plans: Plan A which provides 14 meals per week (lunch and dinner) or Plan B which provides 12 meals per week (lunch and dinner) and a cash component of \$300 to be spent at any University-operated food outlet. Plan C provides 9 meals per week (lunch, and dinner) and a cash component of \$750.

A Vista 150 phone is provided for each student. These phones include call display, automatic local phone service and optional long distance access.

To receive a residence application form, students new to Carleton should indicate on the University application that residence is desired. Residence materials and detailed information are sent to students concurrently with the offer of admission to full-time study at Carleton. There are a number of accessible rooms in residence available for students with disabilities - the minimum requirement of credits that the student must be enrolled in is the equivalent of two full credits. For further information, please see "Resident Attendant Services Program for Students with Disabilities."

Students who are currently registered at Carleton need only visit the Student Housing Office to obtain an application for residence. For further details about residence services or procedures, students should contact the Department of Housing and Food Services.

Off-Campus Housing

Telephone: 520-5614

The Off-Campus Housing Service is designed to provide assistance in finding suitable accommodation to students who cannot be accommodated on campus or who are interested in off-campus housing. This service mainly operates on a self-help basis, with listings of accommodation posted outside 261 Stormont House for viewing 24 hours per day, seven days a week. During normal office hours, staff members are pleased to assist with information, advice, etc. In addition, the Off Campus Centre operates from 9:00 a.m. - 4:00 p.m. during the months of July and August. Staff of

Student Services

the Centre provide personal assistance and further information.

Details regarding each listing include rates and amenities provided. The University does not undertake to inspect or approve any of the facilities listed, so it is strongly advised that the search be undertaken in person. The listings can also be viewed on any terminal having access to the University mainframe by typing the word HOUSING after the "enter class" prompt appears.

In addition, a newsletter titled "Faculty and Staff Listing" is published on the 15th of every month. (Deadline for submissions is the 13th.) This lists accommodations of staff members going on sabbatical leave for periods ranging from four months to two years. Lists are distributed to each department on campus and are available on request.

Food Services

Telephone: 520-5612
Beaver Foods: 520-5618

A-la-carte food service is available in eight locations across campus:

The Food Court offering Mr. Submarine, Taco Bell, Harvey's, Market Grill and Domino's Pizza, second level, University Centre; Second Cup, first level, University Centre; Rooster's Wing, fourth level, University Centre; The Loeb Café, first level, Loeb Building; Junction Second Cup, Library precinct, Tunnel level; The Oasis Cafeteria, first level, Residence Commons; The Bent Coin, fifth level, Robertson Hall

In addition, "all-you-care-to-eat" lunch and dinner is available in the Residence Dining Halls, 3rd level Residence Commons for the price of admission. Students with Campus Cash plans are entitled to reduced prices and tax exemption where permitted.

Vending machines provide off-hour service. Students with Campus Cash plans can make cash purchases without using cash from many of these machines.

A variety of "Campus Cash" plans are available to students offering savings on campus food purchases through both discounts and tax exemptions.

"Care Packages" provide an easy means for friends and families to send birthday cakes, exam study snacks, or celebrate other special occasions with a food treat.

The catering division of food services is equipped to provide banquet services, receptions, party trays or beverage service for groups of up to 800 guests.

Tour and Conference Centre

Telephone: 520-5611
Fax: 520-3952

Each year from May to August, the Housing and Food Services Department operates a successful Tour and Conference Centre. Residence facilities accommodate up to 1,400 guests. A wide range of services including accommodation, catering, meeting rooms, lecture theatres, all at very reasonable rates, are available to conferences and tour groups.

Accommodation is also available to short-term summer visitors from the single traveller staying only one night to students and their families who wish to attend or participate in such University functions as Convocation and first-year student Welcome programs. Long term summer residence (four to six weeks) can be reserved in conjunction with one of four available meal plans.

Arrangements for special functions such as wedding receptions, banquets, parties (large and small) and meetings or other special events are also co-ordinated by the Tour and Conference Centre. Such events may be booked throughout the year.

For further information please contact the Tour and Conference Centre.

Student Life Services

501 University Centre
Telephone: 520-6600
Fax: 520-3995
Website: www.carleton.ca/studentlife

Student Life Services offers a wide range of programs and services to assist students in their adjustment to academic life, in improving their learning strategies, and in making decisions with regard to academic and career concerns.

Campus Life Program

The main goals of campus life programming is to assist new students in a variety of areas (e.g., academic, social, emotional, leadership) thereby easing the transition to life at Carleton University. In addition to orientation activities, services and programs are offered throughout the year to introduce students to the many resources available on campus and to get students involved. The Campus Life Coordinator is also available to discuss student concerns about adjustment issues and motivation.

Study Skills Program

The Study Skills Program coordinates a series of workshops which begin in early September. Topics include: Active Reading, Essay Writing, Oral Presentations, as well as general Study Skills workshops covering Note-taking, Time Management, and Exam Preparation. These workshops are offered in small groups to accommodate discussion and interaction, and participants have access to individual follow-up if needed. Drop by to register in advance for the workshops.

For individual assistance in a specific study skill area, drop-in times are available. Free brochures on topics such as Time Management, Active Reading, Note-taking, Exam Preparation, and Study Skills for its students are available. A variety of study skills videotapes are also available through Instructional Media Services.

International Student Advisory

The International Student Advisor is available to discuss particular concerns international students may have. An orientation program is held every August and January for incoming international students. Information and assistance concerning university education, financial assistance, health coverage UHIP, immigration regulations and the general adjustment to a new living situation are available. Please call for drop-in and appointment times.

Student Life Services is also responsible for Career Services (see p. 23) and the Paul Menton Centre for Persons with Disabilities (see p. 26).

University Centre

The University Centre (Unicentre) is a non-academic, student-oriented building which serves as the hub of the campus. It is home to the Carleton University Students' Association and virtually all of its operations (i.e. coffeehouse, pub, convenience store). Its location and atmosphere makes it the perfect meeting place and an ideal setting for events of interest to all students.

In addition to housing CUSA services, the Unicentre is home to: Student Life Services, Information Carleton, Ombuds Services, the Graduate Students' Association, a division of the Ontario Public Information Research Group, and the Paul Menton Centre. Porter Hall, which is available for both on- and off-campus groups to rent, is also located within the Unicentre.

For a more complete list of the services available, please see the section entitled Carleton University Students' Association. (See p. 23)

Writing Tutorial Service

The Writing Tutorial Service offers individual and small group tutorials to students who want advice on the writing of university essays. The tutors provide practical instruction on all aspects of the writing process from the initial research and data-gathering, to the exploration and organization of ideas, through to the final preparation of the manuscript. In addition, the service regularly presents workshops on style and the general principles of essay writing at the request of Faculty and/or Teaching Assistants. The service is offered free of charge to all Carleton students, part-time and full-time, graduate and undergraduate. For an appointment or information, call 520-6632 or visit 215 Paterson Hall from 9:00 a.m. to 4:00 p.m., Monday to Friday.

Alumni Association

510 Robertson Hall
Telephone: 520-3636
Fax: 520-3587
E-mail: devalum@carleton.ca
Web address: <http://www.carleton.ca/alumni>

The Carleton University Alumni Association represents the over 75,000 graduates of Carleton University. Membership is automatically extended to all graduates, and is available, upon request, to former students who have completed 5.0 credits but are no longer registered at Carleton.

The objectives of the association are to advance the excellence and prestige of Carleton University as a distinguished institution of higher learning in Canada, and to encourage a spirit of loyalty, friendship, service and benevolence among the members.

The alumni association serves the University by promoting its well-being through contact with graduates, government, the public, faculty, students and potential students. Its members are actively involved in various advisory boards and recruiting activities. It is governed by the National Alumni Council, a volunteer group comprised of branch and chapter representatives and committee chairs.

All graduates with known addresses receive the *Carleton University Magazine* three times per year. The Department of Development and Alumni Services maintains alumni records to ensure a meaningful and continuing dialogue between alumni and the University.

The alumni association sponsors Homecoming, reunions, an alumni awards program, and various branch and chapter activities. The association offers services to alumni including life, automobile and home insurance, an affinity MasterCard and diploma framing.

Funds from alumni help to support student awards and other specific projects.

Executive Members of the National Alumni Council for 1999-2000 are:

Jennifer Higgins-Ingham, BA/89, BAHons/92, *President*
Maria McClintock, BA/86, *Vice-President, Membership/Operations*
Patrick O'Reilly, BCom/92, *Vice-President, Policy*
Michael Makin, BJ/86, *Past-President*

Admission Requirements and Procedures

General Admission Requirements

Persons wishing to follow programs of study leading to a degree or certificate must be formally admitted to the University.

Persons wishing to register in degree-credit courses without having been formally admitted to the University may do so as Special students. (See p. 54.)

Minimum entrance requirements vary from program to program. Applicants should note that meeting the minimum requirements of a program does not guarantee them admission to the University. Applications from students whose grades do not meet the requirements in a given year or program will be considered individually. Students in this category may be asked to provide additional information to assist the University in determining where there are special circumstances that would permit their admission to Carleton.

This publication contains admission requirements for the 1999-2000 academic year only. Students wishing to apply for 2000-2001 should contact Admissions Services for information on requirements and procedures.

Individuals who are in any doubt about their eligibility for admission are encouraged to enquire at Admissions Services.

Accessibility for Students with Disabilities

Carleton University is committed to making reasonable accommodation to individuals with disabilities, and actively encourages application from students with disabilities. This commitment includes gaining an understanding of the circumstances of an individual's disabilities and to adjusting services to all academically qualified individuals to compete on an equitable basis.

Students are encouraged to contact the Paul Menton Centre for Persons with Disabilities for further information to enable them to assess the extent to which specialized services will be available.

Academic accessibility is intrinsically linked to physical accessibility. Carleton is committed to continually monitoring and upgrading physical accessibility to whatever extent is possible.

A Standing Committee of Senate monitors the needs and problems of students with disabilities in conjunction with their academic problems and makes recommendation for improvements.

(See Student Services, Paul Menton Centre for Persons with Disabilities, p. 26.)

Multiple Undergraduate Programs

Students who already possess an undergraduate degree, certificate, or diploma from another university or from Carleton University, may apply for admission to a second undergraduate program. In such circumstances, the minimum requirement will be 5.0 additional credits, at least 3.0 of which must be in the area of specialization of the new program. For a second or subsequent undergraduate program, the appropriate residence requirement must be met.

English Language Requirements

1. International applicants and Canadian citizens and residents who do not meet the requirements in 2 or 3 below are required to complete an approved assessment of English as a Second Language administered by the University's School of Linguistics and Applied Language Studies. Depending on the results of this assessment, and based on the recommendations of the School, these applicants may be:

a) admitted to a degree program without further English as a Second Language Requirements; or

b) admitted to a degree program in which they will be required to complete the English as a Second Language Requirement. Such students will be permitted to register for a program of either full- or part-time studies, to include one or more credit courses in English as a Second Language beginning in their first term of study; or

c) permitted to register as Special (non-degree) students on the condition that they enrol in appropriate credit English as a Second Language courses; or

d) permitted to register in non-credit intensive English as a Second Language courses offered by the School.

To satisfy the English as a Second Language Requirement, students must earn a grade of B- or better in either Advanced ESL 21.190 or 21.195. Alternatively, students may satisfy this requirement by achieving a Regular (R) placement category on the Canadian Academic English Language (CAEL) Assessment or by achieving a score of 580 or better on the TOEFL.

2. In order to be eligible for admission without an English as a Second Language Requirement to a degree program at Carleton University, all international applicants and Canadian citizens and residents whose first language is not English or French are required to:

a) present a Regular (R) placement category on the Canadian Academic English Language (CAEL) Assessment;

b) present a minimum score of 580 on the Test of English as a Foreign Language (TOEFL); or

c) present transcripts to indicate that they have studied for the last four years in a Canadian secondary school, in which the language of instruction is English.

3. Applicants whose first language is French must present transcripts to indicate that they have taken four years of Anglais in a Canadian secondary school in order to be admitted without an English as a Second Language Requirement.

Students are expected to complete the English as a Second Language Requirement within one calendar year of their initial enrolment in credit courses. In exceptional circumstances, permission to continue into a second Fall/Winter term registration in ESL courses may be granted by the appropriate Registrar (in consultation with the School of Linguistics and Applied Language Studies). Subsequent registration will be denied to students with the English as a Second Language requirement if the requirement has not yet been met and if they do not show both continuous enrolment and continuous progress in ESL courses (as determined by the School of Linguistics and Applied Language Studies).

For further information regarding the English as a Second Language Requirement and admission contact Admissions Services.

Dates of Entry

Students may be admitted to register in January, May and July as well as in September. (See p. 12 for details on the Academic Year.) It should be noted however, that a full range of courses is only offered during the Fall/Winter session, i.e. September to May.

Levels of Entry

Students may be admitted to Qualifying-University year, First- or upper years depending upon academic qualification. When a student is admitted at the Qualifying-University year level, an Honours degree program is normally five years in length (i.e. Qualifying-University, First, Second, Third, Fourth) and a B.A. degree program is normally four years in length (i.e. First, Second, Third). When a student is admitted at the First-year level, the degree pro-

gram is normally four years for an Honours degree and three years for a B.A. degree. Beyond First year, remaining degree requirements are determined by the total number of credits required for that particular degree program less those credits granted on transfer from previous post-secondary studies.

It should be noted that students who are being considered for admission to the Qualifying-University year level may, at the time of admission, receive credit for work completed at that level in the Canadian high school system.

Concurrent Studies

The Concurrent Studies program enables Secondary School students to begin University-level study while completing any outstanding requirements for their high school diploma. The availability of the Concurrent Studies program will be of particular interest to those students in semestered schools who are not taking a full load of high school credits in their final year of study. Students in non-semestered high schools may also wish to take advantage of this opportunity in their final year if they are not taking a full credit load.

Students who wish to take advantage of the Concurrent Studies program will register as Special students. Special students are permitted to take up to 2.0 approved First-year credits in the Fall/Winter Session and 2.0 approved First-year credits in the Summer Session. With admission to a degree program, program requirements for a degree will be reduced by the number of credits successfully completed as part of the Concurrent Studies program that are appropriate to the degree. Other universities normally grant credit on admission for courses taken at Carleton as a Special student.

Accelerated Progress

Exceptional students who are entering Carleton's Qualifying-University year will be interested in the accelerated progress policy. This unique policy is designed to enable very capable students to proceed towards a degree at a rate commensurate with their ability in university work.

Above-average performance is rewarded with a reduction in credit requirements. For example, in an Arts or Science program, the maximum reduction possible under this policy could result in a student obtaining a degree in three years beyond Grade 12. Detailed requirements are shown in the Calendar entries for faculties.

Qualifying-University Year

This program is offered in the Bachelor of Arts, the Bachelor of Engineering and the Bachelor of Science programs. Students interested in other undergraduate degree programs must first complete an appropriate Qualifying-University year program in Arts, Engineering or Science. (See Summary beginning on p. 41.)

Certificate Programs

In addition to offering fourteen undergraduate degree programs, for which the admission requirements are stated on the following pages, Carleton offers six certificate programs, as follows:

Certificate in English Language and Composition

Admission Requirements

A university degree or teaching certificate. This is an in-service certificate intended primarily for practising teachers, in order to upgrade their knowledge of those areas of language and of writing theory that underlie the Ontario guidelines and support documents.

Refer to p. 232 for program details.

Certificate in Public Service Studies

Admission Requirements

The basic admission requirement is the completion of the OSSD including six OACs, or the equivalent, with an overall average of 60 percent or better. Special consideration will be extended to other applicants under Mature Applicant regulations (see Mature and Special Admissions, p. 55).

Candidates may be admitted with advanced standing, but must complete at least 4.0 credits, including all core courses, for the Certificate at Carleton University. Students who have completed an undergraduate degree are not eligible for admission to this program.

Refer to p. 414 for program details.

Certificate in the Teaching of English as a Second Language

Admission Requirements

Applicants are admitted on the recommendation of the School of Linguistics and Applied Language Studies. Applicants must have either completed a first degree or be registered in a B.A. (Honours) program (in any discipline) at Carleton University.

Refer to p. 328 for program details.

Certificate in Law Enforcement Studies

Admission Requirements

The basic admission requirement is the completion of the OSSD including six OACs, or the equivalent, with an overall average of 60 percent or better. Special consideration will be extended to other applicants under Mature Applicant regulations (see Mature and Special Students Admissions, p. 55).

Candidates may be admitted with advanced standing, but must complete at least 4.0 credits, including all core courses, for the Certificate at Carleton University.

Refer to p. 325 for program details.

Certificate in French Language Studies

Admission Requirements

The basic admission requirement is the completion of the OSSD including six OACs, or the equivalent, with an overall average of 60 percent or better. Special consideration will be extended to other applicants under Mature Applicant regulations (see Mature and Special Admissions, p. 55).

Candidates are required to take French Placement before entry into the program. Depending on the results of the French Placement procedure, candidates may be required to complete one or more prerequisite French courses before taking any required certificate courses.

Refer to p. 253 for program details.

Certificate in French Translation Studies

The basic admission requirement is the completion of the OSSD including six OACs, or the equivalent, with an overall average of 60 percent or better. Special consideration will be extended to other applicants under Mature Applicant regulations (see Mature and Special Students Admissions, p. 55).

Candidates are required to take French Placement before entry into the program. Depending on the results of the French Placement procedure, candidates may be required to complete one or more prerequisite French courses before taking any required certificate courses.

Refer to p. 254 for program details.

High School Applicants

Ontario

The basic admission requirement is the completion of the OSSD, including six OACs, or the equivalent. The overall average and mix of OACs required is dependent upon the degree or program for which the student is applying. Students who have attained this basic requirement will be considered for admission to First year.

Detailed admission requirements for each undergraduate degree program can be found in chart form starting on p. 41.

Carleton University utilizes, for admission purposes, the credit system as defined by the Ministry of Education and Training of Ontario. In calculating averages, the weighting factor assigned to a subject will be directly proportional to the credit value of that subject.

Quebec

Students from the Province of Quebec may apply for admission to Carleton University either upon completion of the Secondary V Certificate or after completing work towards the Collegial Diploma. (See Quebec CEGEPs, p. 35.)

Students applying on the basis of high school studies will be considered for admission to the Qualifying-University year as follows:

General Statement

The Quebec Secondary V Certificate, with a 75 percent average or better and including six college preparatory subjects at the Secondary V level.

Individual Degree Program Requirements

Bachelor of Arts

Secondary V work to include two of: English; a language other than English; mathematics (functions).

Bachelor of Engineering

Secondary V work to include: mathematics (functions); chemistry; physics.

Bachelor of Science

Secondary V work to include: mathematics (functions); two natural sciences (chemistry and physics).

Students who have completed a Grade 12 program will be considered for admission to First year.

Other Canadian Provinces

Applicants to degree programs at Carleton must normally be admissible to a university in their own province.

From the Canadian provinces and territories whose pre-university studies culminate in 12 years of schooling, graduates are considered for direct admission into First year. At the present time, graduates from high schools in the following provinces and territories are considered for admission. The overall average required is dependent upon the degree or program for which the students are applying.

Alberta
British Columbia and The Yukon
Manitoba
New Brunswick
Newfoundland
Northwest Territories
Nova Scotia
Prince Edward Island
Saskatchewan

It is recognized that the curriculum of some provinces does not include an introductory course in calculus, or that a final-year math-

ematics course may have only a few weeks of an introduction to calculus, or that only a few schools in a particular province or territory may offer a calculus course to a selected group of students. In instances where no calculus is presented, and there is a requirement for it in the University program to which the student is admitted, adjustments may have to be made to include Mathematics 69.007 ★ (Introductory Calculus) as an extra half credit beyond the normal degree program requirements.

It should be noted that for some restricted-enrolment programs, preference may be given to applicants who, along with a high academic standing, have completed an introductory course in calculus.

The United States

1. Applicants who have completed Grade 12 in the United States or in a U.S. overseas school will be considered for admission to First year. The Grade 12 program must include at least four academic units, and a minimum of 16 academic units must have been completed in Grades 9 to 12.

2. An average of B- or better is required for admission. For Honours programs, an average of A is required. In either case, the applicants must be ranked in the first quarter of their class.

3. Applicants are encouraged to submit SAT scores to supplement their application for admission to the University.

4. Applicants failing to meet the foregoing requirements but with otherwise a good academic record may be considered for admission to an appropriate Qualifying-University year program.

Other High School Systems

Applicants who have completed high school diploma requirements in other than Canadian or American high school systems will be considered for admission at the appropriate level of entry. Individuals from foreign systems of education will be considered for admission to First year only if they are able to present sufficient evidence that their secondary school background is appropriate to this level of entry with respect to academic content and level of achievement.

Generally speaking, such applicants must meet requirements for admission to a university in their own country.

The following certificates may be accepted to meet admission requirements to First year:

United Kingdom, West Indies, East and West Africa, Hong Kong: The General Certificate of Education (or the equivalent) with satisfactory standing in five subjects at Ordinary Level (or equivalent) and two suitable subjects at Advanced Level.

International: The International Baccalaureate.

The following certificates may be accepted to meet admission requirements to the Qualifying-University year:

United Kingdom, West Indies, East and West Africa, Hong Kong: The General Certificate of Education (or equivalent) with satisfactory standing in five subjects at the Ordinary Level (or equivalent), or the General Certificate of Secondary Education (U.K.) with satisfactory standing in five courses.

Note: Students who achieve at a high level may qualify for a possible reduction in degree requirements. (See Accelerated Progress, p. 232.)

Special Requirements for Overseas Students

Translation of Documents

The University must be in receipt of all official documents by July

1. Applicants from non-English speaking countries must arrange to submit certified English translations of their academic documents.

Financial Information

The University has no scholarships or financial assistance plans available for incoming foreign students at the undergraduate level.

Transfers from Post-Secondary Institutions

Residence Requirement

In order to qualify for a Bachelor's degree, or a certificate from Carleton University, an undergraduate student must complete at Carleton University at least the equivalent of the final year of that degree program, or at least 4.0 credits for any certificate.

When a faculty of the University further specifies "core" level, and detailed departmental requirements, such as Design Project or Honours Thesis, these must also be fulfilled.

Universities

1. Carleton University subscribes to the following General Policy on the Transfer of Course Credits, as adopted by the Council of Ontario Universities:

Acceptance of transfer credits among Ontario universities shall be based on the recognition that, while learning experiences may differ in a variety of ways, their substance may be essentially equivalent in terms of their content and rigour. Insofar as possible, acceptance of transfer should allow for the maximum recognition of previous learning experience in university-level courses.

Subject to degree, grade and program requirements, any course offered for credit by one university shall be accepted for credit by another Ontario university when there is an essential equivalency in course content.

Please contact Carleton's Admissions Services for information about transferring specific courses.

2. Students applying from other recognized universities may be admitted with advanced standing if they are eligible to continue at the institution from which they wish to transfer and if they present an acceptable average.

An applicant who is attending or has attended institutions of post-secondary education must present:

- (a) *Official Certified Transcripts* of academic records mailed directly to this University by the registrars of the institutions attended;
- (b) In addition, applicants who have taken only one year of study past the secondary school level may be required to submit an official transcript of high school marks mailed directly to Carleton University by the high school concerned.

Credit may be received for courses taken at other recognized degree-granting institutions if:

- (i) courses are relevant to a student's proposed program; and
- (ii) the appropriate department recommends that such courses be credited to a student's program. Each application will be evaluated on its own merits.

Students who apply for admission to an undergraduate degree program who already possess an undergraduate degree from either Carleton or another university, are required to complete a minimum of one year's academic work at Carleton University as specified by the department in which the degree is to be taken in order to qualify for another undergraduate degree. (See Multiple Undergraduate Programs, p. 31.)

Provisional Admission

Some transfer applicants (those who have attended only one Canadian university or Quebec CEGEP and have demonstrated better than average academic achievement) will automatically be consid-

ered for provisional admission. The provisional approval will be given prior to the completion of the student's current year, and will provide a detailed statement of the credits to be granted upon transfer. Admission will be confirmed upon presentation of a final transcript that indicates the successful completion of all courses with suitable standing.

Ontario Colleges of Applied Arts and Technology (CAATs)

In Program Applicants:

Students from Ontario Colleges of Applied Arts and Technology who have not completed all requirements in a two or three year Applied Arts and Science diploma program or a two year General Arts and Technology diploma program and who present a minimum 3.0 grade point average (B standing in the Carleton University grading system) will be considered for admission to a Bachelor of Arts ★ degree program based on the following guidelines:

- 1. Applicants who present a minimum 3.0 G.P.A. and who have completed all diploma requirements except the last term/semester in a *three year Applied Arts and Science Diploma Program*, will be considered for admission with advanced standing to a maximum of 5.0 credits (equivalent to one year). The advanced standing would be granted according to the appropriateness of the Applied Arts and Science diploma program and the admission requirements of the BA degree program.
- 2. Applicants who present a minimum 3.0 G.P.A. and who have completed all diploma requirements except the last term/semester in a *two year Applied Arts and Science Diploma Program* or a *two year General Arts and Science Diploma Program*, will be considered for admission with advanced standing to a maximum of 3.0 credits. The advanced standing would be granted according to the appropriateness of the diploma program and the admission requirements of the BA degree program.
- 3. Applicants who present a minimum 3.0 G.P.A. and who have completed *two years of a three year Applied Arts and Science Diploma program* will be considered for admission with advanced standing to a maximum of 4.0 credits. The advanced standing would be granted according to the appropriateness of the Applied Arts and Science diploma program and the admission requirements of the BA degree program.
- 4. Applicants who present a minimum 3.0 G.P.A. after the first year of a *two or three year Applied Arts and Science Diploma program* or a *two year General Arts and Science Diploma Program* will be considered for admission to first year of a BA degree program.

CAAT Graduate Applicants:

Students from Ontario Colleges of Applied Arts and Technology who have successfully graduated in a two or three year Applied Arts and Science Diploma Program or a two year General Arts and Science Diploma Program and who present a minimum 3.0 grade point average (B standing on the Carleton grading system) will be considered for admission to a Bachelor of Arts* degree program based on the following guidelines:

- 1. Graduates of a two year Applied Arts and Science Diploma Program or a two year General Arts and Science Diploma Program who present a minimum 3.0 G.P.A. will be considered for admission with advanced standing to a maximum of 5.0 credits (equivalent to one year). The advanced standing would be granted according to the appropriateness of the diploma program and the admission requirements of the BA degree program.
- 2. Graduates of a three year Applied Arts and Science Diploma program who present a minimum 3.0 G.P.A. will be considered for admission with advanced standing to a maximum of 7.0 credits.

The advanced standing would be granted according to the appropriateness of the Applied Arts and Science diploma program and the admission requirements of the BA degree program.

*These conditions apply *only* to CAAT students who apply for admission to Bachelor of Arts Programs. CAAT In Program Applicants and CAAT Graduate Applicants are eligible to apply for other degree programs which include the Bachelor of Commerce, Bachelor of Engineering, Bachelor of Science, Bachelor of Architectural Studies, Bachelor of Industrial Design, Bachelor of Social Work, Bachelor of Journalism, Bachelor of Public Affairs and Policy Management, Bachelor of International Business, Bachelor of Computer Science, Bachelor of Mathematics and Bachelor of Music. Such persons may enquire about the possibilities of admission by contacting Admissions Services and consulting the information below.

Students from Ontario Colleges of Applied Arts and Technology who present a minimum Second-Class Honours standing will be considered for admission to the University and may receive advanced standing to a maximum of the equivalence of First year. Assessments regarding admission and advanced standing will be based on the following guidelines:

1. Applicants who have achieved an overall Second-Class standing or better, or who have Second-Class standing or better in the last two semesters in a three-year CAAT program, will be considered for admission with advanced standing to a maximum of 5.0 credits (equivalent to one year). The advanced standing would be granted according to the appropriateness of the CAAT program, the course concentration and the achievement in relevant courses.
2. Applicants who have achieved an overall Second-Class standing or better, or who have Second-Class standing or better in the last two semesters of a two-year program, will be considered for admission. While such applicants will not normally receive advanced standing, exceptional applicants can receive advanced standing on the recommendation of the appropriate academic department(s).
3. Applicants who have completed two years of a three-year program and who have achieved an overall Second-Class standing or better, or who have Second-Class standing or better in the last two semesters, will be considered for admission. While such applicants will not normally receive advanced standing, exceptional applicants can receive advanced standing on the recommendation of the appropriate academic department(s).
4. Applicants who have completed the first year of a three-year CAAT program with an overall First-Class standing will be considered for admission to First year of an appropriate University program.

5. Graduates of a two-year or a three-year CAAT program or applicants who have completed two years of a three-year CAAT program who do not meet the minimum published requirements but who are presenting Third-Class standing may receive special consideration on an individual basis.

Other students presenting an incomplete program normally will not be considered for admission to Carleton University on the basis of that program. Such persons may enquire about possible alternatives if they are desirous of seeking admission to a Carleton University degree program at some future date.

Quebec CEGEPs

Admission Requirements

1. A CEGEP applicant who has completed successfully 12 "General" or pre-university courses will be considered for admission to First year, without advanced standing. The overall average required is dependent upon the degree or program for which the student is applying.
2. CEGEP applicants who have successfully completed more than

12 "General" or pre-university courses will be considered for admission with advanced standing based on the number of courses in excess of 12 and not to exceed the equivalent in credits of the First year of the program to which they are admitted. The overall average required is dependent upon the degree or program for which the student is applying.

3. CEGEP applicants from a three year program who have successfully completed more than 12 "General" or pre-university courses will be considered for admission to First year. The overall average required is dependent upon the degree or program for which the student is applying. They may receive advanced standing for courses taken in addition to these 12 provided they correspond to those in the program to which they were admitted. The number of advanced standing credits will not exceed those of First year.

All applicants should note that failures in their CEGEP studies can adversely affect their admissibility.

Subject Requirements

Although specific subject requirements have been kept to a minimum, the following are considered necessary prerequisites for the degree program indicated:

Bachelor of Architectural Studies: mathematics; physics.

Bachelor of Arts: English or anglais.

Bachelor of Commerce: mathematics.

Bachelor of Computer Science: mathematics.

Bachelor of Engineering: mathematics; physics; chemistry.

Bachelor of Humanities: none specified

Bachelor of Industrial Design: mathematics; physics

Bachelor of International Business: mathematics.

Bachelor of Journalism: none specified.

Bachelor of Mathematics: mathematics

Bachelor of Music: none specified.

Bachelor of Public Affairs and Policy Management: none specified.

Bachelor of Science: mathematics; two experimental sciences.

Bachelor of Social Work: none specified

Mature and Special Students Admissions

Mature Applicants

Mature Applicants are persons who satisfy all of the following requirements;

1. are 21 years of age, or over, by December 31 of the year in which they wish to enrol, and
2. are Canadian citizens or permanent residents of Canada, and
3. do not meet the normal admission requirements as published in this calendar, and
4. have been away from full-time studies for a minimum of two calendar years, and
5. have not attended a university or college as full-time students.

Applicants who meet the definition of Mature Applicant will be considered for admission to full-time or part-time studies. They can apply for admission to a B.A. program in the Faculty of Arts and Social Sciences or in the Faculty of Public Affairs and Management, or to a degree program in Engineering, Architecture, Computer Science, Humanities, Industrial Design, Mathematics or Social Work..

These applicants are required to submit proof of age, biographical information and a transcript of their most recent studies.

Admission to the Faculty of Arts and Social Sciences, or to the Faculty of Public Affairs and Management

Mature Applicants will normally be admitted to the First year of a B.A. degree program in the Faculties of Arts and Social Sciences or Public Affairs and Management, or the First year of the undergraduate degree program in Social Work if they have:

- (a) secondary school graduation in an academic program (the overall average required is dependent upon the degree or program for which the student is applying); or
- (b) completed, as a Special student at Carleton University, one appropriate full credit (or two half credits) with C– or better standing in the first attempt (or in both of the first two half-credit course attempts); or
- (c) other academic or work experience which, in the opinion of the admissions committee, indicates a likelihood of success at university.

Mature Applicants are not usually considered for admission to Honours programs in Arts and Social Sciences, Public Affairs and Management and to the programs in Business, Journalism, Music, or Public Affairs and Policy Management. If, however, at the end of their First year in another degree program, they meet the requirements for one of the above mentioned programs, they can apply to transfer to that program.

Admission to the Schools of Architecture, Computer Science, and Industrial Design

Mature Applicants can be considered for admission to the First year in the Schools of Architecture, Computer Science, or Industrial Design if they have the prerequisite subjects for the program to which they wish to apply and if they have:

- (a) secondary school graduation in an academic program with a 60 percent average; or (b) completed, as a Special student at Carleton University, one appropriate full credit (or two half credits) with C– or better standing in the first attempt (or in both of the first two half credit attempts); or (c) other academic or work experience which, in the opinion of the admissions committee, indicates a likelihood of success at university.

The prerequisite subjects (OACs or equivalents) for Architectural Studies, Computer Science, and for Industrial Design are found under Prerequisite Subjects at the end of this section.

Persons applying for admission to these undergraduate degree programs without the necessary prerequisites, will not normally be considered until the prerequisite subjects have been successfully completed. All applications are reviewed on an individual basis.

Admission to the Faculty of Engineering

Mature Applicants can be considered for admission to First year of a degree program in the Faculty of Engineering if they have the prerequisite subjects for the program and if they have;

- (a) secondary school graduation in an academic program with an average of 70 percent or better;
- (b) completed, as a Special student at Carleton University, one appropriate full-credit (or two half-credits) with a C– or better standing in the first attempt (or in both of the first two half-credit attempts); or;
- (c) other academic or work experience which in the opinion of the admissions committee, indicates a likelihood of success at university.

The prerequisites subjects (OACs or equivalent) for Engineering are found under Prerequisite Subjects at the end of this section. A grade of 60 percent or better is required in each prerequisite subject.

Persons applying for admission to this undergraduate degree program without the necessary prerequisites will not normally be considered until the prerequisite subjects have been successfully completed. All applications are reviewed on an individual basis.

Admission to the Faculty of Science

Mature Applicants can be considered for admission to the First year of a Major program in the Faculty of Science if they have the prerequisite subjects for the program and if they have:

- (a) secondary school graduation in an academic program with an average of 70 percent or better;
- (b) completed, as a Special student at Carleton University, one appropriate full-credit (or two half-credits) with a C– or better standing in the first attempt (or in both of the first two half-credit attempts); or;
- (c) other academic or work experience which in the opinion of the admissions committee, indicates a likelihood of success at university.

The prerequisite subjects (OACs or equivalent) for Science are found under Prerequisite Subjects at the end of this section.

Persons applying for admission to this undergraduate degree program without the necessary prerequisites will not normally be considered until the prerequisite subjects have been successfully completed. All applications are reviewed on an individual basis.

Mature Applicants are not usually considered for admission to Honours programs in Science. If, however, at the end of the First year of a Major program, they meet the requirements for one of the Honours programs, they can apply to transfer to that program.

Special Students Wishing to Apply as Mature Applicants

Special students who meet all of the criteria for Mature Applicants, can be considered for admission as Mature Applicants: if

- (a) they have completed, as a Special student, at Carleton University, one appropriate full credit (or two half credits) with a C– or better standing, in the first attempt (or in both of the first two half credit attempts); and
- (b) they are eligible to continue as Special students at Carleton University; and
- (c) they have completed any additional degree program prerequisite subjects which may be required for a particular program.

Mature Applicants, who as Special students at Carleton University, have not obtained a grade of C– or better in one full credit (or two half credits), in the first attempt (or in both of the first two half credit attempts), can attempt to qualify for subsequent admission through additional courses as a Special student at the University.

Individuals seeking admission under the Mature Applicant status who need further information should inquire at the Office of Admissions or the School of Continuing Education.

Special Students

Admission to a Degree Program as a Special Student

Special students may be admitted to a degree program if their academic achievement at Carleton University indicates a reasonable probability of future academic success. Previous post-secondary studies at other institutions will also be taken into consideration at the time the application for admission is evaluated. Students with previous, unsuccessful post-secondary studies are encouraged to contact the Admissions Services or the School of Continuing Education before attempting to qualify for admission on the basis of studies as a Special student.

Normally, in the Faculty of Arts and Social Sciences or Public Affairs and Management, a Special student can be considered for admission to a B.A. degree program after successfully completing at least 4.0 credits (or the equivalent), out of the first six attempts with a CI of 4.00 or better. Every grade which appears on the official transcript constitutes an attempt. Attempts are weighted according to the credit value of the course. See Attempts, section 5.4, p. 71. The CI is calculated by dividing the total number of grade points accumulated over all attempts by the total number of attempts. See Continuation Index, section 5.6, p. 80. Provided that there have been no unsuccessful attempts, students who perform at a higher level can gain admission after fewer credits, i.e. after successful completion of:

2.0 full credits (or the equivalent) with a CI of 10.00 or better, or
2.5 full credits (or the equivalent) with a CI of 8.50 or better, or
3.0 full credits (or the equivalent) with a CI of 7.00 or better, or
3.5 full credits (or the equivalent) with a CI of 5.50 or better.

Normally, in the Faculty of Science, a Special student can be considered for admission to a Major program after passing at least 4.0 approved full credits (or the equivalent) with a C- standing or better in at least 2.0 full credits (or equivalent). Students seeking admission to the Faculty of Science who do not have the necessary prerequisite subjects are usually not considered for admission until the necessary prerequisites have been successfully completed in addition to the 4.0 approved credits (or the equivalent). The prerequisite subjects (OACs or equivalents) are found at the end of this section under Prerequisite Subjects. An average of 70 percent or better is required in the prerequisite subjects. The grade offered in OAC Calculus must be 60 percent or better, and no more than one of the remaining two prerequisite subjects may be offered with a grade below 60 percent.

Special students wishing to apply for admission must meet the requirements within the previous 6.0 full credits (or the equivalent) and cannot present more than two supplemental or grade-raising examinations in meeting the requirements for admission.

Special students who meet the age requirement for Mature Applicants can normally be considered for admission on this basis only if they meet all admission requirements for Mature Applicants.

Special students wishing to apply for admission to the Faculty of Engineering, or the Schools of Architecture, Business, Computer Science, Industrial Design, Journalism, or Social Work, are urged to consult with the Admissions Services and Academic Records or the School of Continuing Education.

Prerequisite Subjects

In programs such as Architecture, Computer Science, Engineering, Industrial Design, Mathematics and Science, students must have completed mathematics and science courses at least at the OAC level before being considered for admission. These are called "prerequisite subjects". The specific OACs (or the equivalent) are listed by program.

Architectural Studies

Calculus or
Algebra/Geometry and
Physics

Computer Science

Calculus
Algebra/Geometry

Engineering

Calculus
Algebra/Geometry
Chemistry
Physics

Industrial Design

Calculus
Algebra/Geometry
Physics

For all of the above programs a grade of 60 percent or better is required in each subject.

Mathematics

Calculus
Algebra/Geometry

Science

Calculus and two of:
Algebra/Geometry
Biology
Chemistry
Physics

An average of 70 percent (75 percent for Honours) or better is required in the prerequisite subjects. The grade offered in OAC Calculus must be 60 percent or better, and no more than one of the remaining two prerequisite subjects may be offered with a grade below 60 percent.

Previous Carleton Students

All former students who have been formally admitted to a degree or certificate program at the undergraduate level, and who are seeking readmission either to that program or to another program, are governed by differing regulations, depending upon the faculty or school that offers the program

Please refer to the relevant program section of this Calendar or, if there is no specific entry dealing with readmission in that section, consult the appropriate Faculty Registrarial Services office to determine whether or not it is necessary to submit a new application for admission. Please note that previous Carleton students applying to limited enrolment programs must apply by the published deadlines.

Admission Procedures

How to Apply

Prospective students, when requesting an application directly from the University, should provide a complete outline of their academic background.

1. The following applicants must apply through the Ontario Universities' Application Centre (OUAC):

(a) Current Ontario high school students should obtain a preprinted application form from their high school and arrange to have it submitted to the Application Centre.

(b) Overseas applicants must obtain a copy of the OUAC 105F application form designed for them either by contacting the Application Centre at 650 Woodlawn Road West P.O. Box 1328, Guelph, Ontario, Canada, N1H 7P4 or the Undergraduate Recruitment Office, 315 Robertson Hall, Carleton University, 1125 Colonel By Drive, Ottawa, Ontario, Canada, K1S 5B6.

(c) Other applicants should obtain a common application form from Admissions Services, Carleton University, and submit this completed form to the Application Centre.

2. All applicants are required to reveal all previous secondary and post-secondary studies (whether they were successfully completed or not) when completing the application for admission.

3. Previous Carleton University students do not apply through the Application Centre unless they also wish to be considered for admission to another Ontario university. If they wish to apply solely to Carleton, they request a Carleton application form from Admis-

sions Services and submit the completed form directly to that office. If they wish to apply to another Ontario university as well as to Carleton, they should, in addition, request a common application form (OUAC 105), complete and mail it with the application fee to the Centre. Carleton should not be included as a choice on the OUAC 105 form.

Application Deadlines

The following are application dates for the 1999-2000 admission year:

February 1: Applicants to the Bachelor of Architectural Studies and the Bachelor of Social Work degree programs.

March 1: Applicants to the Bachelor of Humanities and the Bachelor of Music degree programs.

April 1: Applicants whose documents originate outside Canada or the United States.

May 1: Applicants to the School of Journalism and Communication.

May 1: All applicants whose documents originate in Canada or the United States, except applicants to the School of Architecture, the School of Journalism and Communication, Music or the School of Social Work.

June 30: Students registered in a degree program at Carleton University applying for a transfer to another degree program.

Note: Applications for admission may be received after these dates, but the University cannot guarantee that all late applications will be processed in time for registration in the academic session requested. Applicants to programs with limited enrolment should note that such programs may be filled by this date.

Documents

Documents submitted in support of an application for admission become the property of the University. In some cases, original documents (for example, General Certificate of Education) may be returned to the applicant.

The University may nullify an admission and revoke a registration if it finds that an applicant for admission or registration has, in the process, provided false or incomplete information.

Applicants who are unable to submit documents of previous academic studies as a result of natural disaster, armed conflict, or the securing of refugee status are subject to the following policy:

1. Applicants who are unable to submit supporting documents will not be admitted. They will be encouraged to register as Special students and qualify for admission by taking courses at the University.

2. Applicants who can submit official transcripts but cannot submit course descriptions will be admitted to First year if:

(i) their academic record meets the standards required by the program for which they are applying;

(ii) their high school studies include prerequisite subjects for admission to First year.

3. Applications from candidates who can provide course descriptions based on their recollection of the courses which they have taken will be treated according to the same procedures as those which apply to applicants who cannot submit course descriptions (see 2. above).

Early Admission

Offers of early admission will be based on the previous year final and current year interim marks.

For Ontario high school applicants, offers of admission will be made from March 10 to mid-June for the 1999 admissions cycle. The onus is on each student who does not receive an offer of early admission to supply official final marks to Admissions Services.

Out-of-province applicants will receive an offer of admission as soon as interim marks are received by the University and the assessment is completed.

Applicants to a restricted enrolment program should note that their acceptance to an offer of admission must be received by Admissions Services within two weeks from the date the offer was made.

Carleton reserves the right to withdraw offers of admission for failure to complete the school year satisfactorily. In addition, applicants are advised that although they may receive an offer of admission based on interim marks, final marks, when they are received, will become part of the University's admission record.

Deferred Admission

Applicants who are unable to register for the academic year to which they were admitted, or who wish to postpone their studies for one year, can request a deferred admission. This request must be made in writing and submitted to Admissions Services no later than September 15 of the year during which they were admitted. Applicants must state the reason(s) for requesting a deferred admission.

Applicants who have been granted a deferred admission will receive before their registration, an updated Statement of Standing which will reflect any changes in their program requirements that may have occurred in the intervening time because of changes in programs and/or regulations.

A deferred admission is usually not granted for programs where enrolment is very limited. Students who have been admitted to these programs and wish to postpone their studies for one year should contact Admissions Services to have their application for admission deferred until the next admission cycle. At that time their application will be studied with those of other applicants to the program.

Applicants who have been granted a deferred admission and who register at another post-secondary institution will have their admission withdrawn and will have to submit a new application for admission.

Co-operative Education

Co-operative Education is based on the principle that during the undergraduate years an academic program combined with alternating work periods is desirable for effective professional preparation. Work periods allow students to acquire experience in the area of career interest, while the academic terms can more properly be devoted to fundamental and theoretical studies. The practical experience is not a substitute for, but rather a complement to academic studies.

The motivation, responsibility and opportunity for insight gained through Co-operative education can be of significant value to students. The Co-operative concept enables those with a career orientation to become full-time students of their subject, both during the academic terms and during the related work terms, within a structure of organized purpose and serious study.

The following programs currently have approved Co-op options and students should refer to the individual departments for specific information:

- Aerospace Engineering
- Applied Physics
- Biology
- Business (B.Com.)
- Chemistry
- Civil Engineering
- Communications Engineering
- Computer Science
- Computer Systems Engineering
- Earth Sciences
- Electrical Engineering
- Engineering Physics
- Environmental Engineering
- Industrial Design
- Mathematics and Statistics
- Mechanical Engineering
- Software Engineering

Operation of the Co-op Office

Students in the Co-op programs administered by the Co-op Office must satisfy the normal requirements for their degree programs as well as the graduation requirements specific to the Co-operative option in order to graduate with the Co-op designation.

Necessary arrangements for integrating work terms, securing potential employers, arranging interviews, and generally managing the employment process are handled by the Co-op Office. In addition, the Office is involved in counselling students, visiting them on the job, assisting them to adjust to work situations and encouraging their professional development. Each participating program has a Co-op Adviser who will support and counsel students in their specific program.

Students are expected to maintain communication with the Co-op office on all matters pertaining to participation in the Co-op program. Consultation with the Co-op Office is essential where regulations and procedures for the Co-op option are an issue.

The Work/Study Sequence

The work study sequence and number of mandatory work terms varies according to the individual program. Four-month, eight-month, twelve-month or sixteen-month work terms may be available. Please consult the calendar entry for each program for details. Students in the Co-op option normally require an additional year to complete their degree program.

Co-operative Education Admission Requirements

To be eligible for Co-op, students must be admitted to an honours degree program in Commerce, Computer Science, Engineering, or Science, must be registered full-time and must be eligible to work in Canada. As admission and continuation requirements vary somewhat as to the year of entry and GPA required, please consult the calendar entry for the individual programs.

Students not admitted to Co-op directly from high school may apply for admission to the Co-op option of their program at the beginning of the term preceding their first work term. Completed applications should be submitted to the Co-op Office by January 8, May 8, and September 8 for the respective work terms. Further information is available from the Co-op Office or from the individual academic units.

Employment

Although every effort is made to find a sufficient number of work term positions for all students enrolled in Co-op, no guarantee of employment can be made. The employment process is competitive and dependent on market conditions. As well, academic performance, skills, motivation, maturity, attitude and potential will determine whether a student is offered a job.

Where students are unable to obtain suitable employment through the normal placement process or have been given permission to seek their own job but fail to do so, they are expected to continue their academic program on a full-time basis. The only exception to this rule occurs in the Summer term.

Registration in Work Terms

Unless otherwise stated in the descriptions of specific Co-op options, all work terms must be completed before the end of the final academic term. Co-op students must be registered as full-time students in all academic terms of the Co-op option from point of entry through to the final academic term. The only exception occurs when a student may have sufficient credits to be able to register as a part-time student in the final term. During a work term, Co-op students must register in one of the work term courses designated by their program. While on a work term, students are limited to an additional 0.5 credit, unless they have written support from their employer to take 1.0 credit.

Students are normally expected to complete the full complement of work terms in the prescribed academic term/work term sequence. With prior approval from the Co-op Office, however, allowance can be made for personal considerations, educational opportunities, and other extenuating circumstances.

Seeking Employment and Employer Interviews

Students are expected to seek employment through the interview process arranged by the Co-op Office (or the individual co-op programs). Students may not seek employment directly with a Co-operative employer unless specific arrangements are made with the Office. Students may arrange their own work term assignment with permission of the Co-op Office, but must have the position approved by their faculty co-op advisor or co-op co-ordinator before it may be considered for credit. Students intending to find their own jobs may not take part in the normal application and interview process arranged by the Co-op Office.

Student Files and Release of Information

A Co-operative Student Record is maintained for each student in the Co-operative options. This record contains information relating to the completion of work terms, assessment of work term reports, Employer Evaluation of Co-operative Student forms, records of Co-ordinator interviews, etc. This confidential file is available for examination by the student upon proof of identity. No information may be removed from the file.

By registering in the Co-op option, students agree that academic transcripts and pertinent information from their Co-op student records will form part of the application package and may be made available to potential employers.

Work Term Assessment

Successful completion of a work term is achieved by the submission of a satisfactory work term report and receipt of a satisfactory evaluation from the employer. Students are expected to submit a written work term report at the end of each four-month work term. During an extended work period the work term report requirement may be for shorter interim reports and a full-length final report. Employers may require additional reports from students as part of the job. Normally, for a report to be considered it must have been written during the work term, or immediately following the work term, and be related to or evoked by the work-term activity. In addition, Co-op students will be assessed on their work performance by their work-place supervisor, the assessment being reported to the Co-op office.

Provision is made for students to upgrade Unsatisfactory work reports for re-evaluation by the beginning of the student's next academic term. Students who fail to submit a work report or who fail to upgrade an Unsatisfactory work report will have a work-term failure recorded on their Academic Student Record.

The Co-op Office provides a common set of written guidelines for all work term reports. Work term reports are evaluated and graded by the relevant department.

An unsatisfactory work term report or a poor assessment in the work-place will not affect students' academic progress, but may result in their being required to withdraw from the Co-operative option.

Employer Performance Evaluations

Evaluation of each student's performance is recorded on the "Employer Evaluation of Co-operative Student" form. The student should ensure that the employer has sent a completed evaluation to the University. An Unsatisfactory evaluation is investigated by the Co-operative Office and may result in a work term failure being recorded on the Co-operative Student Record. Employer evaluations are not recorded on a student's transcript.

Voluntary Withdrawal from the Co-operative Option

Students may withdraw from the Co-op option without penalty. Such students are eligible to continue in their regular program provided they meet the academic standards required for continuation in that program.

Required Withdrawal from the Co-operative Option

Students may be required to withdraw from the Co-op option for one or more of the following reasons:

- failure to meet the academic standards required for continuation in the Co-op option (see individual departmental sections for details);
- failure to submit a work term report;
- submission of an unsatisfactory work term report or receipt of an unsatisfactory employer evaluation;
- dismissal with cause by an employer;
- refusal to accept a position which the student has ranked;
- failure to report to an employer or leaving an employer without prior approval;
- independent search for a work placement by the student in addition to participating in the placement process arranged by the Co-op Office. (Note: Students may find their own placement but must first obtain the approval of their faculty co-op advisor or co-op co-ordinator for the position obtained.);
- missing a pre-arranged interview with an employer.

Standing and Appeals

The Co-op Office administers the regulations and procedures applicable to the Co-operative programs and will report instances of a student's failing a work term or being required to withdraw from their Co-op option to their academic department. Any decision of the Office may be appealed through the normal channels within the University.

Co-op Regulations

Co-op students are responsible for satisfying all co-op regulations in the respective program's Co-op Handbook.

Summary of Admission Requirements (Undergraduate Degree Programs)

Architecture

Degree

B.A.S.

Admission Requirements, Qualifying-University Year

As there is no Qualifying-University year in Architectural Studies, students must complete this level of study in high school or by registering in either Qualifying-University year Science or Engineering in an appropriate course pattern. Hence, the admission requirements at this level are those for Qualifying-University year Science or for Qualifying-University year Engineering as stated elsewhere in this chart.

Admission Requirements, First Year

The OSSD or the equivalent, with an average of 65 percent or better, including six OACs, including Calculus, or Algebra and Geometry, and Physics; or the successful completion of Qualifying-University year with an appropriate course pattern.

Note: a portfolio is required.

Arts

Degrees

B.A. (Honours)

B.A.

Admission Requirements, Qualifying-University Year

The OSSD. A 75 percent average must be presented on a minimum of ten Advanced credits in Grades 11 and 12, including two of: English, a language other than English or Mathematics, at the Grade 12 level.

Ontario applicants with two or three OACs may be granted advanced standing for one or two Qualifying-University year credits if the mark in each OAC considered for advanced standing is 75 percent or better, and providing that these OACs are not used to meet the minimum OSSD requirements.

Admission Requirements, First Year

For B.A. (Honours): The OSSD or the equivalent, with an average of 65 percent or better, including six OACs, a core consisting of an OAC in English (or anglais) with a grade of 60 percent or better, and one from among OAC courses in history, geography, economics, law, mathematics, science, performing or creative arts, French (or français) or a language other than English or French with a grade of 60 percent or better; or the successful completion of Qualifying-University year.

For B.A.: The OSSD or the equivalent, with an average of 60 percent or better, including six OACs, a core consisting of an OAC in English (or anglais) with a grade of 60 percent or better, and one from among OAC courses in history, geography, economics, law, mathematics, science, performing or creative arts, French (or français) or a language other than English or French with a grade of 60 percent or better; or the successful completion of Qualifying-University year.

The cut-off point for admission will be set annually, and the cut-off point will normally be above the minimum requirement. Applicants falling below the cut-off point will be considered on an individual basis to determine whether there are special circumstances that would permit their admission.

For the B.A. program in Biology, an OAC in Chemistry is required, and an OAC in Calculus and OAC in Algebra/Geometry or the equivalent (Mathematics 69.017 ★ and 69.007 ★) are recommended.

Students intending to major in Canadian Studies should present an OAC in French.

For a major in Economics, an OAC in Calculus and one in either Algebra and Geometry or in Finite Mathematics are recommended. Students lacking these courses should take Mathematics 69.017 ★ and 69.007 ★. These will be counted as credits towards a degree in Economics.

Admission Requirements are for the 1999-2000 year only, and are based on the Ontario High School System. Holding the minimum admission requirements only establishes eligibility for consideration.

Commerce

Degree

B.Com. (Honours)

Admission Requirements, Qualifying-University Year

As there is no Qualifying-University year in Commerce, students must complete this level of study either in high school or by registering in Qualifying-University year Arts in an appropriate course pattern. Hence, the admission requirements at this level are those for Qualifying-University year Arts as stated elsewhere in this chart.

Admission Requirements, First Year

The OSSD or the equivalent, with an average of 70 percent or better, including at least six OACs, one of which must be Calculus, one must be either Algebra and Geometry or Finite Mathematics, and one must be English. A grade of 60 percent or better is required in Calculus; or successful completion of Qualifying-University Year with a GPA of 6.5 or better including Mathematics 69.007★ and 69.017★, with a CI of 6.00 or better and evidence of an equivalent to an OAC English credit.

First Year with Co-operative Option

The OSSD or equivalent with an average of 75 percent or better, including at least six OAC's, one of which must be Calculus, one must be either Algebra and Geometry or Finite mathematics, and one must be English. A grade of 65 percent or better is required in Calculus

Computer Science

Degree

B.C.S. (Honours)

Admission Requirements, Qualifying-University Year

As there is no Qualifying-University year in Computer Science, students must complete this level of study in high school or by registering in an appropriate course pattern in Qualifying-University year Arts, Science or Engineering.

Admission Requirements, First Year

The OSSD or the equivalent, including six OACs, two of which must be (i) Calculus OAC and (ii) Algebra and Geometry. An overall average of 70 percent or better is required along with an average of 70 percent or better in both Calculus and Algebra and Geometry; or the successful completion of Qualifying-University year with a GPA of 7.0 or better and including Mathematics 69.007★ and 69.017★ also with a GPA of 7.0 or better.

First Year with Co-operative Option

The OSSD or equivalent, including six OACs, two of which must be (i) Calculus and (ii) Algebra and Geometry. An overall average of 85 percent or better is required along with an average of 85 percent or better in both Calculus and Algebra and Geometry; or the successful completion of Qualifying-University Year with a GPA of 11.0 or better and including Mathematics 69.007★ and 69.017★ also with a GPA of 11.0 or better. Students who do not meet these requirements on entry to the B.C.S. program may apply for admission to the Co-operative Option when they meet the requirements specified in the B.C.S. program. (see p.203) for the School of Computer Science.

Engineering

Degree

B. Eng.

Admission Requirements, Qualifying-University Year

The OSSD. A 75 percent average must be presented on a minimum of ten Advanced credits at Grades 11 and 12 including an appropriate preparation in Chemistry, Physics and Grade 12 Mathematics.

Ontario applicants with two or three OACs may be granted advanced standing for one or two Qualifying-University year credits if the mark in each OAC considered for advanced standing is 75 percent or better, and providing that these OACs are not used to meet the minimum OSSD requirements.

Admission Requirements, First Year

The OSSD or the equivalent, including at least six OACs with an overall average of 70 percent or better. The six OACs must include Calculus, Algebra and Geometry, Chemistry and Physics, with an average of 70 percent or better; or the successful completion of Qualifying-University year with an appropriate course pattern. Although it is not an admission requirement, at least one OAC in either English or Français is recommended.

Humanities

Degree

B.Hum. (Honours)

Admission Requirements, Qualifying-University Year

As there is no Qualifying-University year in Humanities, students must complete this level of study either in high school or by registering in Qualifying-University year Arts in an appropriate course pattern. Hence, the admission requirements at this level are those of Qualifying-University year Arts as stated elsewhere in this chart.

Admission Requirements, First Year

The OSSD or the equivalent, with an average of 80 percent or better, including six OACs; or the successful completion of Qualifying-University year with an appropriate course pattern and the required average.

Note: Prospective students must submit a portfolio consisting of

- a one-page statement of why they wish to enter the program,
- a 750-word essay based on reflections on the theme or book chosen each year by the College, and
- a sample of a marked written exercise. The portfolio should be submitted to the College of Humanities, Carleton University, by February 1.

Industrial Design

Degree

B.I.D.

Admission Requirements, Qualifying-University Year

As there is no Qualifying-University year in Industrial Design, students must complete this level of study in high school or by registering in either Qualifying-University year Science or Engineering in an appropriate course pattern. Hence, the admission requirements at this level are those for Qualifying-University year Science or for Qualifying-University year Engineering as stated elsewhere in this chart.

Admission Requirements, First Year

The OSSD or the equivalent, with an average of 65 percent or better, including six OACs, which must include Calculus, Algebra and Geometry, and Physics; or the successful completion of Qualifying-University year with an appropriate course pattern.

Although it is not an admission requirement, an OAC in English is strongly recommended.

Note: It is strongly recommended that candidates present a portfolio of any kind of work that could demonstrate creativity and aptitude for the study of industrial design. Candidates are normally expected to make arrangements for a personal interview at the school.

International Business

Degree

B.I.B. (Honours)

Admission Requirements, Qualifying-University Year

As there is no Qualifying-University year in International Business, students must complete this level of study either in high school or by registering in Qualifying-University year Arts in an appropriate course pattern. Hence, the admission requirements at this level are those for Qualifying-University year Arts as stated elsewhere in this chart.

Admission Requirements, First Year

The OSSD or the equivalent, with an average of 75 percent or better, including at least six OACs, one of which must be either Calculus or Algebra/Geometry or Finite Mathematics and the other must be English. A grade of 60 percent or better is required in the mathematics course offered. If Finite Mathematics is offered, the student must also have successfully completed Grade 12 Advanced Mathematics.

Some knowledge of another language will be beneficial.

Journalism

Degree

B.J. (Honours)

Admission Requirements, Qualifying-University Year

As there is no Qualifying-University year in Journalism, students must complete this level of study either in high school or by registering in Qualifying-University year Arts in an appropriate course pattern. Hence, the admission requirements at this level are those for Qualifying-University year Arts as stated elsewhere in this chart.

Admission Requirements, First Year

The OSSD or the equivalent, with an average of 65 percent or better, including six OACs or the successful completion of Qualifying-University year.

Although it is not an admission requirement, an OAC in English is recommended.

Mathematics and Statistics

Degree

B.Math. (Honours)

Admission Requirements, First Year

Honours Program

The OSSD or the equivalent, with an average of 75 percent or better, including six OACs, including a core consisting of one OAC in Calculus and one OAC in Algebra and Geometry (or the equivalent). In addition, an average of 75 percent or better is required in the core OACs.

Students lacking an OAC in Algebra and Geometry (or the equivalent) must successfully complete Mathematics 69.017★ as a free elective, before taking a 100-level Algebra course.

Major Program

The OSSD or the equivalent, with an average of 70 percent or better, including six OACs, including a core consisting of one OAC in Calculus and one OAC in Algebra and Geometry (or the equivalent). In addition, an average of 70 percent or better is required in the core OACs.

Students lacking an OAC in Algebra and Geometry (or the equivalent) must successfully complete Mathematics 69.017★ as a free elective, before taking a 100-level Algebra course.

Music

Degree

B.Mus. (Honours)

Admission Requirements, Qualifying-University Year

As there is no Qualifying-University year in Music, students must complete this level of study either in high school or by registering in Qualifying-University year Arts. Hence, the admission requirements at this level are those for Qualifying-University year Arts as stated elsewhere in this chart.

Admission Requirements, First Year

The OSSD or the equivalent, with an average of 65 percent or better, including six OACs; or the successful completion of Qualifying-University year.

Although it is not an admission requirement, an OAC in English is recommended.

Note: an audition is required.

Public Affairs and Policy Management

Degree

B.P.A.P.M.

Admission Requirements, Qualifying-University Year

As there is no Qualifying-University year in Public Affairs and Policy Management, students must complete this level of study either in high school or by registering in Qualifying-University year Arts. Hence, the admission requirements at this level are those for Qualifying-University year Arts as stated elsewhere in this chart.

Admission Requirements, First Year

The OSSD, or equivalent, including six OACs, with an overall average of 80 percent or better.

Science

Degrees

B.Sc. (Honours)

B.Sc.

Admission Requirements, Qualifying-University Year

The OSSD. A 75 percent average must be presented on a minimum of ten Advanced credits at Grades 11 and 12, including an appropriate preparation in Chemistry, Physics and Grade 12 Mathematics.

Ontario applicants with two or three OACs may be granted advanced standing for one or two Qualifying-University year credits if the mark in each OAC considered for advanced standing is 75 percent or better, and providing that these OACs are not used to meet the minimum OSSD requirements.

Admission Requirements, First Year

Honours Program

The OSSD or the equivalent, with an average of 75 percent or better, including six OACs, including a core consisting of one OAC in Calculus and at least two OACs chosen from Algebra and Geometry, Biology, Chemistry, and Physics. In addition, an average of 75 percent or better is required in the core OACs.

A grade of 60 percent or better is required in Calculus and not more than one of the two remaining core courses may have a grade below 60 percent.

For Honours in Psychology, an OAC in English is recommended.

Major Program

The OSSD or the equivalent, with an average of 70 percent or better, including six OACs, including a core consisting of one OAC in Calculus and at least two OACs chosen from Algebra and Geometry, Biology, Chemistry, and Physics. In addition, an average of 70 percent or better is required in the core OACs.

A grade of 60 percent or better is required in Calculus and not more than one of the two remaining core courses may have a grade below 60 percent.

Social Work

Degree

B.S.W. (Honours)

Admission Requirements, Qualifying-University Year

As there is no Qualifying-University year in Social Work, students must complete this level of study in high school or by registering in Qualifying-University year Arts. Hence, the admission requirements at this level are those for Qualifying-University year Arts as stated elsewhere in this chart.

Applicants should also refer to the notes appearing in the Admission requirements for First year.

Admission Requirements, First Year

The OSSD or the equivalent, with an average of 65 percent or better, including six OACs; or the successful completion of Qualifying-University year.

Although it is not an admission requirement, an OAC in English is strongly recommended.

Preference will be given to applicants with human service work experience which may be met by employment and/or volunteer experience. Each applicant will be requested to complete a personal data information document which will assist in the evaluation of their suitability for the program.

Registration

Requirements

In order for students to register for an academic session the following requirements must be met:

- a) new students must be formally admitted to a degree or certificate program OR have completed the required application for Special student studies;
- b) returning students must be academically eligible to continue in their program;
- c) there must be no outstanding account with the university;
- d) International students must be enrolled in or have received permission for exemption from the University Health Insurance Plan (UHIP).

Detailed instructions regarding registration and course offerings for the Fall/Winter Session will automatically be mailed to newly admitted and returning students. Information regarding Summer Session is normally available in Faculty Registrarial Services offices by March 1.

Regulations

Students are normally governed by the regulations contained in the Calendar that is in effect at their first registration in their current degree program, unless it is expressly stated otherwise. Students may choose, however, to complete their studies under new regulations that are introduced, if they meet the requirements of these new regulations.

Course Selection

All course selection and course change activity (adds, drops, withdrawals, change of section) is normally carried out using the university's Touchtone Telephone Voice Response Registration System. Course selection must be completed according to the requirements of the faculty or school and major departments in which the student is registering. Students planning to undertake professional training beyond their undergraduate studies should ensure that their programs meet the requirements for admission to, or registration with, their intended post-graduate program.

Auditing Courses

Students may register to audit courses (i.e. attend without receiving credit) in addition to those course being taken for credit. Although audited courses receive no academic credit they are counted as part of the total course load for both academic and fee assessment purposes. Access to courses for purposes of auditing is determined by demand for credit space in such courses. Some courses are not available for audit purposes. The deadline to change a course enrolment from credit to audit or audit to credit is the last day for course changes.

Cross-Listed Courses

Some courses in the Calendar appear under the course offerings of more than one department. These are referred to as cross-listed courses. Students planning to enrol in such a course are advised to consult with their academic advisor, in advance of registration, to ensure that the course number under which they will be enrolling is appropriate to their program. Changes in the department designation of a cross-listed course in which a student has registered cannot be made after the last day for course changes in the term or session.

Payment of Fees

Registration is not complete until fee payment arrangements have been finalized with the University Business Office.

Deregistration

The University may cancel a registration in the following circumstances: if it is determined that an applicant for admission has, in the process, provided false or incomplete information; if fee payment arrangements for a session are not completed according to registration requirements.

Challenge for Credit

Challenge for Credit is a Carleton University policy that enables students to gain undergraduate academic credit for their own learning and experience outside the University.

Challenge for Credit is available only to students formally admitted to and registered in a program leading to a Degree or Certificate.

This policy gives the student the opportunity to be examined on, and receive credit for, a recognized Carleton course without meeting the normal requirements of registration, attendance, and instruction. Students wishing to Challenge for Credit should enquire at their Registrarial Services office, with documentation to support the challenge. If the academic department, after an interview, is satisfied that the student has adequate experience and learning related to the course in question, it sets an appropriate examination. If the student is successful in the examination, the course is credited to his or her academic record.

Not all courses offered at the University are open to Challenge for Credit. Students interested in obtaining more information should contact their Faculty Registrarial Services office.

Transfer of Credit for Courses Completed at Other Universities

1. Prior to Admission

At the time a student is considered for admission, credit may be granted for individual courses successfully completed at other recognized, degree-granting institutions, if:

- (a) the individual courses are relevant to a student's proposed program; and
- (b) the appropriate academic department recommends such action.

Each application is evaluated on its own merits. (See also p. 34)

2. Subsequent to Admission

(a) Letter of Permission

Students who have been formally admitted to a degree or certificate program may take courses at other universities on Letters of Permission, and have the credits transferred to their Carleton programs, provided they obtain formal approval prior to commencing each course.

(b) University of Ottawa Exchange Agreement

Undergraduate students may register to take courses at the University of Ottawa to be credited to their Carleton program. The following regulations apply:

- (i) Students must be registered in a degree program and must be in good standing. In the case of First-year studies, a maximum of two half-credit courses may be taken at the University of Ottawa that year.

(ii) Only courses to be credited as part of the degree requirements at Carleton may be taken under the terms of the exchange.

(iii) At any time the cumulative total of courses taken at Carleton and counting towards the degree must be greater than the total number of courses taken and/or proposed to be taken at the University of Ottawa

(iv) Courses taken under the Exchange Agreement shall not count towards Residence Requirements at Carleton.

Applications and information about deadlines and registration procedures are available in all Registrarial Services offices. Students should note that space in courses may be limited and therefore applications should be filed well in advance of registration.

(c) International Exchange Agreements

Undergraduate students may be eligible to take advantage of other exchange agreements with universities throughout the world. For details on these exchanges, students should consult with their Registrarial Services office and the Office of Carleton International (1506 Dunton Tower) at least a year in advance of the proposed exchange.

Degree Program Changes

Students wishing to change faculty or school (Internal Degree transfers) must make application through Admissions Services. The deadlines for such changes for the Fall/Winter Session are:

Fall Term: June 30

Winter Term: December 1

Changes in B.A.(Honours), B.A.: Program Options

Students wishing to change Majors or program options or to change between B.A. (Honours) and B.A., must apply for such changes through their Registrarial Services office. Such applications must be made according to deadlines specified by the Registrarial Services office.

Withdrawal

The responsibility for taking all steps necessary for withdrawal from an individual course, from several courses, or from all courses resides with the student. Ceasing to attend classes, or informing an instructor of intent to withdraw does not constitute withdrawal. Withdrawal is normally done by using the Touchtone Voice Response Registration system. The official date of withdrawal is the date on which the student completes the necessary withdrawal action on the touchtone system.

Students must withdraw from courses on or before the appropriate last date for withdrawal as indicated in the Academic Year. It is not possible to withdraw from a course or courses or from the University after the appropriate designated last date for withdrawal.

Withdrawal activity may affect a student's academic standing as prescribed by regulations governing their program. Students are advised to consult their Registrarial Services office for information and guidance. A student who withdraws from a course retains no academic credit for any part of that course.

Fee adjustments for students who are withdrawing from a course, courses, or entirely from the University will be calculated as of the date of the official notification of withdrawal.

Residence Requirement

In order to qualify for a degree from Carleton University, a student must complete a minimum number of credits at Carleton University. For the specific number and type of credits required, refer to the appropriate faculty section of this Calendar.

To obtain an undergraduate certificate from Carleton University, students must present a minimum of 4.0 credits taken at Carleton, including all core courses.

Student Records Information

Names

As the University is committed to the integrity of its student records, students are required to provide either on application for admission or on personal data forms required for registration, their complete, legal name. Any requests to change a name, by means of alteration, deletion, substitution or addition, must be accompanied by appropriate supporting documentation. Upon making application for graduation, students may be asked to provide proof of their name.

Addresses

Incorrect address information will delay the receipt of awards, examination results and notification of changes in academic status. Students must notify their Registrarial Services office immediately of any change in:

- (a) permanent or home address (used for registration information);
- (b) local address (used for all mail during the academic session);
- (c) telephone number for permanent address and for local address.

Academic Standing and Conduct

General

The Senate may at any time require a student to withdraw from the University if his or her conduct, attendance, work or progress is deemed unsatisfactory.

Evaluation

To obtain credit in a course, students must meet all the course requirements for attendance, term work and examinations. Before the last date for course changes, instructors will inform their classes, in writing, of all the elements that will contribute to the final grade, and the weighting of each. In those courses in which supplemental examinations are an option, instructors shall also inform their classes, in writing, that supplemental examinations are available to all undergraduate students who have been awarded a grade of F. Students will also be informed in writing, of the method of computing the final grade revised by such examinations. See the Faculty of Engineering regulations for a description of the conditions permitting the writing of supplemental examinations.

Standing in Courses

Standing in courses will be determined by departments. Standing in courses will be shown by alphabetical grades. The system of grades used, with corresponding grade points, is as follows:

A+	12	B+	9
A	11	B	8
A-	10	B-	7
C+	6	D+	3
C	5	D	2
C-	4	D-	1

Grade points indicated above are for courses of one credit in value. Where the course credit is greater or less than one credit, the grade points are adjusted proportionately.

The following percentage equivalents apply to all final grades at Carleton.

A+	90-100	B+	77-79
A	85-89	B	73-76
A-	80-84	B-	70-72
C+	67-69	D+	57-59
C	63-66	D	53-56
C-	60-62	D-	50-52

Other notations are as follows:

Aeg

Pass standing granted under special circumstances. Aegrotat standing is granted only by a faculty committee, in response to a student's application. (See Deferred Final Examinations, p. 48.)

And

Indicates course is not being taken for academic credit.

F

Failure. No academic credit.

FNS

Failure without access to supplementals because of incomplete term work or unacceptably low standing. No academic credit. (Not used after 1997-98)

FWS

Failure with access to supplementals. (Applicable only to 400-level courses in Engineering)

Abs

Absent from final examination. No academic credit. Abs is usually equated to failure.

Wdn

Withdrawn in good standing. No academic credit.

Def

Indicates deferral of final grade has been approved by a faculty committee. (See Deferred Final Examinations, p. 48.)

IP

In Progress.

Cb

Credit granted under challenge for credit policy.

Sat

Satisfactory.

Uns

Unsatisfactory.

Academic Standing

The conditions under which undergraduate students may be promoted, or placed on or relieved of probation, are shown in the Calendar entries for the Faculties and schools.

Program Year

Progress through degree studies is normally measured in terms of program years. The program year represents the accumulation of the number of credits normally taken in a Fall/Winter session of full-time study in the program in question. In addition, in some jurisdictions, program year implies the accumulation of a certain pattern of credits.

Religious Accommodation

Carleton University accommodates students who, by reason of religious obligation, must miss an examination, test, assignment deadline, laboratory, or other compulsory event.

Accommodation will be worked out directly and on an individual basis between the student and the instructor(s) involved. Students should make a formal request to the instructor(s) in writing for alternative dates and/or means of satisfying requirements. Such requests should be made during the first two weeks of any given academic term*, or as soon as possible after a need for accommodation is known to exist, but in no case later than the penultimate week of classes in that term. Instructors will make reasonable accommodation in a way which shall avoid academic disadvantage to the student.

Students unable to reach a satisfactory arrangement with their instructor(s) should contact the Director of Equity Services. Instructors who have questions or wish to verify the nature of the religious event or practice involved should also contact this officer.

*When a student's presence is required prior to the date on which classes begin (e.g. for field trips or Orientation activities) any student who cannot meet this expectation of attendance for reasons of religious accommodation should notify the appropriate Registrarial Services office in advance.

Examination Regulations

Students writing tests and examinations should be aware of the rules governing examination conduct, which are printed on the back cover of official examination booklets.

It may be necessary to schedule mid-year and final examinations during the day for classes held in the evening and vice versa.

All tests and examinations, except laboratory examinations, oral and slide tests and other particular tests, are subject to the following rules:

1. Tests or examinations given in class may not exceed the time allotted for the class;
2. Final examinations in the Summer session will be held in official examination periods;
3. In courses numbered below the 200-level, mid-year and final examinations will be held in the official examination periods;
4. In courses numbered below the 400-level, no tests or examinations may be held during the last two weeks of Fall, Winter or Summer terms, or between the end of classes in a term or session and the beginning of formally scheduled examinations.
5. In courses below the 400-level, take-home examinations may not be assigned before the last day of classes and are due on the last day of the official examination period;
6. In courses at the 400-level, arrangements for examinations outside the official examination period are at the instructor's discretion but must be announced at least three weeks in advance.

Deferred Final Examinations

Students who are unable to write a final examination because of illness or other circumstances beyond their control, or whose performance on the examination has been impaired by such circumstances, may, on application, be granted permission to write a deferred final examination. Such applications must:

1. be made in writing to the appropriate Registrarial Services office no later than five working days after the original final examination (students in the Faculties of Arts and Social Sciences and Public Affairs and Management see p. 73); and
2. be fully supported in cases of illness by a medical certificate dated no later than one working day after the examination or by appropriate documents in other cases.

Aegrotat standing may be considered for applicants for deferred finals but will be granted only if term work has been of high quality. A student granted aegrotat standing may apply to write a deferred final examination.

Normally deferred examinations are held in February for Fall Term courses, in June for Fall/Winter and Winter Term courses and in October for Summer Session courses except where such a delay might delay graduation in the Fall.

Note: In the following half-credit courses in Mathematics and Statistics and Physics, where the course is offered in two successive terms, Deferred Final Examinations will be taken in April for Fall Term courses and in December for Summer Session courses: Mathematics 69.007★, 69.107★, 69.109★, 69.117★, 69.119★, 69.207★, 69.208★, 69.217★, 69.257★, and 69.259★. Physics 75.101★, 75.102★, 75.107★, 75.108★.

Examinations deferred from Winter Term will normally take place in June.

Students who have obtained approval for a deferred final examination in an itv course will not be able to access tapes for the course after the end of the academic session.

Review of Grades

Students are entitled to a review of a final grade. Those wishing to receive such a review should enquire at their Registrarial Services office, after which they may wish to make a formal application for this review. Applications must be filed according to the application deadlines for each term (See p. 12.)

Note: The review may lower the grade.

Requests for review are dealt with by the departmental chair in consultation with members of the department.

The charge for each review is refundable if the grade is raised.

Supplemental Examinations

Supplemental examinations are available in all 400-level undergraduate courses with written final examinations in the Faculty of Engineering. For a description of conditions under which supplemental examinations may be written, see Faculty of Engineering regulations (p. 85.)

Release of Grades

With the commencement of each Final examination period students may hear their grades by calling the Touchtone Voice Response Registration system at 520-7800 and entering their student number and personal access code.

Students may obtain a copy of their official transcript by completing a "Request for Academic Transcript" form which is available from 315 Robertson Hall. Transcripts required for professional and graduate schools should be ordered well in advance of any deadline set by these institutions.

Final grades, including official transcripts, are not released by the University to students with outstanding accounts.

Graduation Requirements

In order for students to receive their degree, they must fulfill:

1. all the requirements of the department(s), school or institute in which they are taking the degree;
2. all faculty regulations;
3. all University regulations;
4. all financial obligations to the University.

The student is responsible for meeting graduation requirements. Acceptance of a registration does not grant exemption from any regulation.

Students who wish to be considered for graduation must apply at their Registrarial Services office by the following deadlines:

February 1 - Spring Graduation (June)
September 1 - Fall Graduation (November)
December 1 - Winter Graduation (February)

Records Retention Policy

Since 1990 the University has implemented a records retention policy which provides for the destruction of student file folders and their contents after a period of 10 years has elapsed since the last registration. This policy applies to those students who are formally admitted and registered in degree programs. Further information on this policy can be obtained by contacting Records and Registration Services.

Instructional Offences

The Senate of the University has enacted the following regulations for instructional offences:

Any student commits an instructional offence who:

1. cheats on an examination, test, or graded assignment by obtaining or producing an answer by deceit, fraud or trickery, or by some act contrary to the rules of the examination;
2. submits substantially the same piece of work to two or more courses without the prior written permission of the instructors from all courses involved. Minor modifications and amendments, such as changes of phraseology in an essay or paper, do not constitute a significant and acceptable reworking of an assignment;
3. contravenes the regulations published at an examination or which are displayed on the reverse side of a properly authorized examination booklet;
4. commits an act of plagiarism (which for the purpose of this regulation shall mean to use and pass off as one's own idea or product work of another without expressly giving credit to another);
5. disrupts a class or other period of instruction if he or she:
 - (a) is a registered member of the class or period of instruction;
 - (b) is warned to discontinue any act or behaviour reasonably judged by the instructor of the course or period of instruction to be detrimental to the class, and having ignored such warning is ordered by the instructor to leave and refuses to leave.
6. any student found in violation of these regulations may be:
 - (a) expelled;
 - (b) suspended from all studies at the University;
 - (c) suspended from full-time studies;
 and/or
 - (d) awarded a reprimand;
 - (e) refused permission to continue or to register in a specific degree program but subject to having met all academic requirements shall be permitted to register and continue in some other program;
 - (f) placed on academic probation;
 - (g) awarded an *F* or *Abx* in a course or examination.

Allegations of instructional offence may be investigated by instructors and/or departmental chairs and, in all cases, will be reported to the faculty Dean. The Dean will promptly advise, in writing, the student and the University Ombudsperson of the allegation and of the student's rights. The Dean will review the allegation and, if not resolved at that level, the allegation becomes subject to final disposition by a tribunal appointed by the Senate. Information about procedure governing tribunals is available from the Clerk of Senate, 607 Robertson Hall.

Allegations of Instructional Offence involving students participating in the Carleton/University of Ottawa Exchange program will be investigated according to procedures established at the host institution. The results of such investigations will be forwarded to the home institution for final disposition.

Offences of Conduct

The University has in place regulations and procedures to deal with allegations of misconduct made against students in the areas of discrimination and sexual harassment.

Discrimination:

The University has enacted the following regulation:

Any student commits a general offence who commits an act of discrimination on the basis of race, ancestry, place of origin, colour, ethnic origin, national origin, creed, sex, age, marital status, family status, political affiliation or belief, sexual orientation, or any handicap that is defined as such in the Human Rights Code of Ontario.

The University has also approved the following procedures for enforcement of this regulation:

1. an allegation shall be made in writing to the Dean of the Faculty in which the program to which the respondent has been admitted belongs or, in the circumstances where the respondent has not been admitted to a program, to the Dean of the Faculty where the majority of courses in which the respondent has registered are administered. An allegation against a student in residence when made by another student in residence which involves the complainant's enjoyment of her/his accommodation shall be made to the Vice-President (Academic). The Dean, or the Vice-President (Academic), as the case may be, shall cause to have an investigation conducted and, upon receipt of the report of the investigation, shall either 1) dismiss the allegation on the grounds of insufficient evidence or lack of jurisdiction by the University, or 2) accept that the allegation is founded and seek the agreement of the respondent to a remedy, or 3) refer the matter to the President. A Dean's dismissal of the allegation may be appealed, within ten working days, to the Vice-President (Academic) who may, in turn, either 1) again dismiss the allegation, or 2) accept that the allegation is founded and propose a remedy to the respondent, or 3) refer the matter to the President. In the case of students in residence, where the original allegation has been made to the Vice-President (Academic) and is dismissed, appeal shall be directly to the President who may either 1) again dismiss the allegation, or 2) accept that the allegation is founded and propose a remedy to the respondent, or 3) refer the matter to a tribunal appointed by the Senate.

2. in the instance where the matter has been referred to the President, the latter shall decide whether or not the University shall conduct a hearing before a tribunal appointed by the Senate.

If the allegation is proven, the tribunal shall decide upon one of the following sanctions:

The student may be:

- a) expelled;
- b) suspended for a period of time from all studies at the University;
- c) restricted in his/her use of University facilities; and/or
- d) given a reprimand.

Should the President decide not to conduct a hearing before a tribunal, the allegation shall be deemed to have been dismissed, but the President shall give written reasons for such a decision, and these reasons shall be communicated to the parties involved.

3. in the instance where the complainant wants redress from the University without the involvement of the respondent, or where the respondent is unknown or is not a member of the University community, and/or where there is a claim that the University has failed or has been negligent in providing a safe, non-hostile environment, the allegation of an offence shall be made in writing to the President, who shall cause an investigation to be conducted. Upon receipt of the report of the investigation, the President may order any relief he/she deems fit, and shall give written reasons for the decision; which reasons shall be communicated to the complainant.

Information about procedure governing tribunals is available from the Clerk of Senate, 607 Robertson Hall.

Sexual Harassment:

The University has approved a Sexual Harassment Policy which defines sexual harassment as follows:

1. sexual harassment may occur irrespective of gender and is:
 - a) unwanted attention of a sexually oriented nature, made by a person who knows or ought reasonably to know that such attention is unwanted; and/or

- b) an implied or expressed promise of reward for complying with or submitting to a sexually oriented request or advance; and/or
- c) an implied or expressed threat of reprisal for not complying with or submitting to a sexually oriented request or advance.

Sexual harassment may include, but may not be limited to, behaviour such as:

- unwarranted touching;
- suggestive remarks or other verbal abuse in a sexual context;
- leering;
- compromising invitations;
- demands for sexual favours;
- sexual assault.

2. sexual harassment may also be: engaging in a course of sexual comment or conduct that is known or ought reasonably to be known to be unwelcome. This form of sexual harassment may affect individuals or groups. It may take the form of excluding an individual or a group from rights and/or privileges to which they are otherwise entitled.

3. sexual harassment may be psychological, verbal or physical and may be all of these. It is behaviour prohibited by the University for all persons and circumstances over which the University has jurisdiction. In some of its forms it may contravene the Human Rights Code of Ontario. Sexual assault is a crime pursuant to the Criminal Code.

4. regulations governing the conduct of students and employees of the University are applied to those times and places at which the actions of such employees and students relate to or impinge upon their function as such.

The University's Sexual Harassment Policy provides for advisory and mediation services to assist in resolving perceived situations of sexual harassment before they reach the level of formal allegation. Attention is drawn, in this regard, to the role of the University's Adviser on Sexual Harassment complaints. The adviser may be contacted at 520-5622, Equity Services.

The University has enacted regulations under which allegations of General Offence (Sexual harassment) may be made against students. These regulations state that a student commits a general offence who engages in conduct which constitutes sexual harassment as defined in the University's Sexual Harassment Policy.

The University has also approved procedures for the handling of allegations of general offence (sexual harassment) against a student. These procedures, as well as the sanctions which a tribunal can impose, are the same as those outlined above for acts of discrimination, save and except that the investigators charged with the investigation which the Dean, the Vice-President (Academic), or the President, as the case may be, shall cause to have conducted, must be selected from the Panel of Investigators provided for under the terms of the University's Sexual Harassment Policy.

Mention: français

The Senate of the University has approved the notation "Mention: français," which a student may earn within a B.A. (Honours) or B.A. degree under certain prescribed conditions.

The student must demonstrate the capability of working in French within the discipline of his or her degree, and must also demonstrate knowledge of the history and culture of French Canada. The specific credit requirements (three for a B.A. degree and four for a B.A. (Honours) degree) are developed by individual departments within the University according to the Senate's guidelines, and ap-

proved by the Senate. Students wishing to register for the notation must first demonstrate capability of working in French at the First-year level. Students should refer to their departments for specific information about what arrangements may be available.

The following Schools, Institutes and Departments offer the "Mention:français": Canadian Studies, History, Linguistics and Applied Language Studies, Philosophy, Political Science, Psychology, Public Administration, and Sociology and Anthropology.

Academic Dress

The academic dress of Carleton University is a compromise between the style of hoods outlined in the American Intercollegiate Code and the dress of the ancient foundations of Britain and America. All three hoods, Bachelor's, Master's, and Doctor's, are of the simple or Oxford shape. The Bachelor's hood is made of black stuff, the Master's and the Doctor's of black silk, and all are lined with silver silk with two chevrons, one of red and one of black. From Bachelor's to Doctor's the hoods are progressively longer and opened to show more and more of the lining.

The velvet border of the hoods, 5 cm. in width for Bachelor's, 7.5 cm. for Master's and 8 cm. for Doctor's, denotes the degree granted, according to the following colour combinations: Architecture, cerise; Arts, white; Commerce, camel brown; Computer Science, royal blue; Engineering, orange; Humanities, white with a red cord sewn slightly in from the lower border; Industrial Design, dark cardinal; International Business, camel brown with a red cord sewn slightly in from the lower border; Journalism, white with a black cord sewn slightly in from the lower border; Management Studies, camel brown with a black cord sewn slightly in from the lower border; Mathematics, emerald green; Music, Venetian pink; Public Admin-

istration, pea-cock blue; Science, golden yellow; Social Work, cream; Doctor of Philosophy, purple.

The Master's and Bachelor's gowns, to be worn with the above hoods, are of full length, made of black stuff, with a gathered yoke behind, and long open-fronted sleeves. The Doctoral gown is of full style, made of fine royal blue cloth with facings of light blue silk, with a full gathered yoke behind, and closed sleeves with an opening at the elbows.

The gown of the Honorary Doctor of Laws, Literature, Science, Engineering, Architecture or Fine Arts is a blue robe with bell-shaped sleeves, made of fine royal blue cloth with facings and sleeves in light blue silk. The hood is made of the same material as the gown, has the same lining as that for the degrees granted by examination, and is bordered with dark mauve for the degree of Doctor of Laws, vibrant blue for the degree of Doctor of Literature, red for the degree of Doctor of Science, orange for the degree of Doctor of Engineering, cerise for the degree of Doctor of Architecture, and dark cardinal for the degree of Doctor of Fine Arts.

Fees

Tuition Fees and Charges 1999-2000

Tuition fees, late charges, and other fees and charges are reviewed in the spring of each year. At the time of printing, tuition fees and charges for 1999-2000 were not yet decided upon.

Once fees and charges have been set, specific details will be published on Carleton's website (<http://www.carleton.ca/fees/>) and in the *Registration Instructions and Class Schedule* booklet which is made available to all incoming and returning students during the month of July. Students are advised to familiarize themselves with this information.

Dates Relating to Fees and Charges

Dates relating to tuition fee payments, cancellations of course selections, late charges, and other fees or charges are published in the Important Dates and Deadlines section of the 1999-2000 *Registration Instructions and Class Schedule* booklet.

Library

MacOdrum Library

Telephone: 520-5621 (hours recording)

520-2735 (Reference and Information)

Fax: 520-2750

Email: university_librarian@carleton.ca

WWW address: www.library.carleton.ca/

Senior Staff

University Librarian

Martin Foss

Associate Librarians

Terry Sulymko (Systems and Technical Services)

Linda Rossman (Information Services)

Department Heads

Gail Catley (Acquisitions)

Bozena Clarke (Access Services)

Alison Hall (Cataloguing)

Anita Hui (Collections)

Susan Jackson (Maps, Data, and Government Information)

Callista Kelly (Interlibrary Loans)

Elizabeth Knight (Reference Services)

Dorothy Rogers (Gifts)

Collection

The University Library, located on the south-west side of the main quadrangle, provides access to a wide variety of materials in support of teaching, learning, and research activity at Carleton. The collection includes more than three million books, periodicals, government documents, maps, newspapers, musical scores, compact discs, microforms, archives and rare books. To locate material in the system, you must consult CUBE, the Library's online catalogue. Access to electronic resources is provided through CD-ROM databases, the Internet, and an online literature search service. Increasingly, more materials are acquired through various commercial document delivery services.

Borrower Information

Books may be borrowed at the Circulation Desk or by using the self-check machine located on the Main floor of the Library. You must have a validated ID card with a barcode or Patron Number in order to borrow. Users of the self-check machine must also know their Personal Access Code. Items, with the exception of reserve materials, circulate for two weeks to undergraduate students, and for four weeks to fourth year honours students, graduate students, faculty and staff. On payment of an appropriate fee, alumni of Carleton University and the general public may purchase an outside borrower's card which entitles the holder to limited borrowing privileges.

The Library participates in the Ontario Council of University Libraries (OCUL) Resource Sharing Agreement. This permits all students, faculty, and staff with a valid Carleton ID card, to register at participating Ontario libraries in order to borrow material directly. The Library also participates in IUBP (Inter-University Borrowing Program), which allows Carleton students to borrow from Quebec universities. The Center for Research Libraries offers students access to its material through the Interlibrary Loans Department. As part of a reciprocal borrowing agreement with the University of Ottawa, students, faculty, and staff of Carleton University are given limited borrowing privileges at the University of Ottawa Libraries.

Regulations

The Library is governed by Senate-approved regulations. The collection is protected against theft by an electronic book detection system. If requested, Library borrowers must submit books, briefcases, and bags for inspection at the Stacks Services Desk. Late return fines and billing costs are charged for overdue books. Borrowers with three overdue books will have their privileges automatically suspended until all items are returned. Examination grades and transcripts will be withheld from students who owe money to the University.

Specialized Collections

CBC Newsworld

The CBC Newsworld Collection is an archival and research collection of videotaped programs housed in Room 402.

Maps, Data, and Government Information Centre

Maps

The Map collection consists of print, microform, and digital cartographic photographs.

Data Centre

The Data Centre is a depository for machine-readable social sciences data and a resource to facilitate data analyses.

Government Documents

The Documents collection has print, microform, and electronic publications issued by governments at every level, including international, intergovernmental organizations. The collection is particularly strong in Canadian federal and provincial documents, and publications of international agencies.

Special Collections and Archives

Some print and manuscript materials, because of the content, format, age or value, must be preserved and kept apart from the general collection. This material, as well as the Carleton University Historical Collection and the Library Archives, is housed in Room 503.

Specialized Services

Interlibrary Loans

If the Library does not have the materials you need, you may request that they be borrowed from another library. Books are usually loaned free of charge; charges may apply for periodical articles provided through conventional I.L.L. or through commercial document delivery services.

Joy Maclaren Adaptive Technology Centre

The Adaptive Technology Centre, located in Room 232, is equipped with adaptive equipment for use by students with disabilities who are registered with the Paul Menton Centre. Wheelchair accessible CUBE terminals, equipped with large monitor, are available throughout the Library.

Orientation

General tours, CUBE instruction, specialized course seminars and workshops are offered by staff from Reference Services and the Maps, Data, and Government Information Centre. The Library maintains a computer-equipped training centre in Room 102 for instruction in the use of CUBE and other electronic information sources.

Research Assistance

Reference Services staff will assist clients in finding library materials, researching essay topics, and identifying the best resources to consult for information needs.

Continuing Education

302 Robertson Hall
Telephone: 520-3500
Fax: 520-3502

Officers of the School

Director

Bernadette Landry

Special Student Services

Karen Spencer (Registration Co-ordinator)

General Information

The School of Continuing Education, in conjunction with other departments at Carleton, co-ordinates and develops both existing and new activities in adult, part-time and non-traditional education on-campus and at a distance. The School of Continuing Education is dedicated to providing lifelong learning opportunities to all those who have the ability and desire to learn.

All currently registered and prospective Special students (see Student Classification, below), should contact the School for registrarial information and to make academic orientation appointments (520-3500). Evening appointments are available on request.

Office Hours

Labour Day to April 30

Monday to Friday, 9:00 a.m. - 5:00 p.m.

Monday to Thursday, 5:30 - 7:30 p.m.

May 1 to Labour Day

Monday to Friday, 8:30 a.m. - 4:30 p.m.

Monday to Thursday, 5:30 p.m. - 7:30 p.m.

Student Classification

As outlined on p. 16, there are several distinct student classifications at Carleton. Students are classified on the basis of whether they have been formally admitted to a degree program, not on the basis of whether they are studying part-time or full-time.

Degree students are those who have been admitted to, and are enrolled in, a degree program, whether graduate or undergraduate, on either a full-time or part-time basis.

Special students are those who have not been admitted to a degree program but who are taking degree-credit courses to qualify for admission, to improve professional qualifications, for transfer credit or for personal interest.

Professional Development students are those enrolled for non-credit professional development courses.

Special Students

Any person interested in pursuing learning opportunities is eligible to apply as a part-time Special student in degree-credit courses, subject to course availability and course prerequisites. The application fee is \$35.00.

Special students enrol in the same courses and meet the same course requirements as students in degree programs and may register for day, evening, instructional television or Tapes-to-You courses at a distance.

All registrarial services for Special students are provided through the School of Continuing Education. Current or prospective part-time degree students are encouraged to consult the appropriate Faculty regulations.

Proficiency in English

Since the instructional language of the University is English, applicants (including Special students), must be able to understand and be understood in English, both written and oral.

See p. 31 for the statement of policy governing English language requirements for non-native speakers.

Course Load

Special students may normally enrol in a maximum of 2.0 credits per academic session (Fall/Winter or Summer) and no more than the equivalent of 1.0 credit (e.g. two half-credits) in any one term. Deferred and supplemental (Fourth-year Engineering only), examinations scheduled during the term and audit courses are included in calculating the course load. (See p. 31.)

Special students who have completed one or more full credits with an overall CI of 5.00 in all credits taken at Carleton (including failures) may register in the equivalent of 1.5 credits in each term of the Fall/Winter session.

During the Fall/Winter session, Special students may enrol in 5.0 credits under either of the following conditions:

1. The student is enrolled full time in a degree program at another institution and can present a Letter of Permission authorized by an appropriate official of the institution; or
2. The student holds an undergraduate degree from a recognized institution and wishes to pursue further study for professional development or in preparation for entry into graduate study.

Course Selection

Anyone wishing to be admitted eventually to a degree program is advised to note the specific Faculty requirements for course selection and the admission requirements for Special and Mature entrants as they are listed in this Calendar. Special students who have not completed an OSSD or equivalent may need to upgrade their qualifications by enrolling in courses at the Qualifying-University year level. Individuals seeking admission who need further information should inquire at the Admissions Services or the School of Continuing Education.

Special Students Enrolling in Graduate-Level Courses

Anyone wishing to enrol in a graduate-level course as a Special student must obtain a letter of permission from the Chair or Supervisor of Graduate Studies of the appropriate department. Anyone considering a graduate degree is urged to contact the Faculty of Graduate Studies and Research prior to registration as a Special student. Special students enrolled in a graduate-level course are subject to Special student regulations and English language proficiency requirements outlined in the Undergraduate Calendar. (See also p. 31.)

Auditing

With the permission of the instructor, students may register as auditors in those courses which are not designated as having limited enrolment. Auditors receive no grade and no credit for courses audited.

Changes from credit to audit are not permitted in limited enrolment courses.

Continuation for Special Students

In order to be eligible for further registration, returning Special students must pass 4.0 of their previous 6.0 credits with a C- standing or better in at least 2.0 credits. A grade of Abs is judged equivalent to a failure in determining eligibility for further registration as a Special student. Students who do not meet the continuation requirement will be required to withdraw from the University.

Students who are required by the University to withdraw from a degree or certificate program are ineligible to register as Special students for one calendar year. In addition, such students should not normally expect to gain readmission to a degree program on the basis of work completed as a Special student, nor should they expect to retain credit for these courses.

Course Change and Course Withdrawal

Special students wishing to make any change in their registration must do so through the Carleton University Touchtone Telephone Registration System.

Course changes must be made by the deadline dates designated in the Academic Year. Changes include additions, withdrawals, section changes, as well as changes of status from credit to audit or vice versa.

Please note that students who are withdrawing from a course or courses, or from the University entirely, must do so through the Carleton University Touchtone Telephone Registration System.

The date of withdrawal is the date on which the phone call is made to the Touchtone Telephone Registration System. Fee adjustments will also be calculated as of that date.

It is not possible to withdraw from a course(s) or from the University after the last date for withdrawal.

Notes: 1. *The responsibility for taking all steps necessary for withdrawal rests entirely with the student.* Non-attendance of classes, or informing an instructor of intent to withdraw does not constitute withdrawal.

2. A student who withdraws from a course retains no academic credit for any part of that course.

Deferred Final Examinations

Please see p. 48.

Appeals

A Special student has the right to appeal any decision regarding the application or interpretation of academic regulations made by the School of Continuing Education.

Appeals must be made in writing and should be submitted to the Secretary, Special Student Policy and Appeals Committee, c/o School of Continuing Education, 302 Robertson Hall, Carleton University.

Financial Assistance

Special students interested in obtaining financial assistance are advised to contact the Student Awards Office at 520-3600 eight weeks prior to registration. For further information, see p. 22 (Awards Office).

Special Student and Mature Applicant Admission

Admission to a Degree Program as a Special Student

Special students may be admitted to a degree program if their academic achievement at Carleton University indicates a reasonable probability of future academic success. Previous post-secondary studies at other institutions will also be taken into consideration at the time the application for admission is evaluated. Students with previous, unsuccessful post-secondary studies are encouraged to contact Admissions Services or the School of Continuing Education before attempting to qualify for admission on the basis of studies as a Special student.

Normally, in the Faculty of Arts and Social Sciences, and the Faculty of Public Affairs and Management, Special students can be considered for admission to a three-year degree program after successfully completing at least 4.0 credits out of the first six attempts with a CI of 4.00 or better. The CI is calculated by dividing the total number of grade points accumulated over all attempts by the total number of attempts. (See Academic Standing, section 5.4.) Provided that there have been no unsuccessful attempts, students who perform at a higher level can gain admission after the successful completion of fewer credits.

2.0 credits with a CI of 10.00 or better, or
2.5 credits with a CI of 8.50 or better, or
3.0 credits with a CI of 7.00 or better, or
3.5 credits with a CI of 5.50 or better.

Normally, in the Faculty of Science, Special students can be considered for admission to a three-year degree program after passing at least 4.0 approved credits with a C- standing or better in at least 2.0 credits. Students seeking admission to the Faculty of Science who do not have the necessary prerequisite subjects are usually not considered for admission until the necessary prerequisites have been successfully completed in addition to the 4.0 approved credits. The prerequisite subjects (OACs or equivalents) are found under Prerequisite Subjects at the end of this section. A grade of 60 percent or better is required in each prerequisite subject.

Special students wishing to apply for admission must meet the requirements within the previous 6.0 credits.

Special students wishing to apply for admission to the Faculty of Engineering or the Schools of Architecture, Business, Computer Science, Industrial Design, Journalism, or Social Work, are urged to consult with Admissions Services or the School of Continuing Education.

Admission to a Degree Program as a Mature Applicant

A) Mature Applicants

Mature Applicants are persons who satisfy all of the following requirements:

1. are 21 years of age, or over, by December 31 of the year in which they wish to enrol; and
2. are Canadian citizens or permanent residents of Canada; and
3. do not meet the normal admission requirements as published in this Calendar; and
4. have been away from full-time studies for a minimum of two calendar years; and
5. have not attended a university or college as full-time students.

Applicants who meet the definition of Mature Applicant will be considered for admission to full-time or part-time studies. They can apply for admission to a program in the Faculties of Arts and Social Sciences, or Public Affairs and Management, or to a Major program in the Faculty of Science or to a degree program in Engi-

neering, Architectural Studies, Computer Science, Industrial Design, or Social Work.

These applicants are required to submit proof of age, biographical information and a transcript of their most recent studies.

B) Special Students

Special students who meet all of the criteria for Mature Applicants can be considered for admission as Mature Applicants if

- (a) they have completed as Special students, at Carleton University, 1.0 credit with a C- or better, in the first attempt (or in both of the first two half-credit attempts); and
- (b) they are eligible to continue as Special students at Carleton University; and
- (c) they have completed any additional degree program prerequisites.

Mature Applicants, who as Special students at Carleton University, have not obtained a grade of C- or better in 1.0 credit (or two half-credits), in the first attempt (or in both of the first two half-credit attempts), can attempt to qualify for subsequent admission by taking additional courses as a Special student at the University.

Individuals seeking admission under the Mature Applicant status who need further information should inquire at the Office of Admissions or the School of Continuing Education.

Admission to the Faculties of Arts and Social Sciences and Public Affairs and Management

Mature Applicants will normally be admitted to the First year of a three-year degree program in the Faculties of Arts and Social Sciences or Public Affairs and Management, or the First year of the undergraduate degree program in Social Work if they have:

- (a) secondary school graduation in an academic program with a 60 percent average or better; or
- (b) completed, as a Special student, at Carleton University, an appropriate 1.0 credit or two half-credits with C- or better in the first attempt (or in both of the first two half-credit attempts); or
- (c) other academic or work experience which, in the opinion of the admissions committee, indicates a likelihood of success at university.

Mature Applicants are not usually considered for admission to Honours programs in Arts and Social Sciences or Public Affairs and Management and to the programs in Business, Humanities, Journalism, Music or Public Administration. If, however, at the end of their First year in another degree program, they meet the requirements for one of the above-mentioned programs, they can apply to transfer to that program.

Admission to the Faculty of Engineering, the Faculty of Science, the Schools of Architecture, Computer Science, and Industrial Design

Mature Applicants can be considered for admission to the First year of a three-year program in the Faculty of Science or to the First year of a degree program in the Faculty of Engineering and in the Schools of Architecture, Computer Science, or Industrial Design if they have the prerequisite subjects for the program to which they wish to apply and if they have:

- (a) secondary school graduation in an academic program with a 60 percent average or better; or
- (b) completed, as a Special student, at Carleton University, an appropriate 1.0 credit or two half-credits with C- or better in the first attempt (or in both of the first two half-credit attempts); or

(c) other academic or work experience which, in the opinion of the admissions committee, indicates a likelihood of success at university.

The prerequisite subjects (OACs or equivalents) for Engineering, Science, Architectural Studies, Computer Science, and for Industrial Design are found under Prerequisite Subjects at the end of this section. A grade of 60 percent or better is required in each prerequisite subject.

Persons applying for admission to these undergraduate degree programs, without the necessary prerequisites, will not normally be considered until the prerequisite subjects have been successfully completed. All applications are reviewed on an individual basis.

Mature Applicants are not usually considered for admission to Honours programs in Science. If, however, at the end of the First year of a three-year program, they meet the requirements for one of the Honours programs, they can apply to transfer to that program.

Prerequisite Subjects

In programs such as Architectural Studies, Computer Science, Engineering, Industrial Design and Science, students must have completed mathematics and science courses at least at the OAC level before being considered for admission. These are called "prerequisite subjects". The specific OACs (or the equivalent) are listed by program.

Architectural Studies

Calculus or
Algebra/Geometry and
Physics

Computer Science

Calculus
Algebra/Geometry

Engineering

Calculus
Algebra/Geometry

Chemistry

Physics

Industrial Design

Calculus
Algebra/Geometry
Physics

Mathematics

Calculus
Algebra/Geometry

Science

Calculus and two of:
Algebra/Geometry
Biology
Chemistry
Physics

A grade of 60 percent or better is required in each subject.

Transfer Credits to Another University

Students who wish to attend Carleton to receive credits toward a degree program taken elsewhere are eligible to register at Carleton as Special students. Students must provide Continuing Education with a Letter of Permission from their home university well in advance of the session for which they plan to register.

Instructional Television

302 Robertson Hall
Telephone: 520-4055
Fax: 520-4456
E-mail: itv@carleton.ca
E-mail: distanceeducation@carleton.ca
Web address: <http://www.carleton.ca/itv>

Director, Robin Allardyce

Manager, Presentation and Technical Operations, Jeff Cohen

Manager, Instructor/Student Services, Beverlae Buckland

Manager, Distance Learning, Shelly O'Hara

General Information

Carleton University provides opportunities for full- and part-time studies to students on the campus and beyond through several types of access to instruction and learning. These include courses offered on campus presented through classroom lectures, seminars, laboratory practice and tutorials. An alternative mode of access is delivery of courses by Instructional Television (itv). Televised courses or course sections are available to students on campus, as well as to those participating from a distance. Instructional Television may be considered as an opportunity to experience learning in a different way and can provide students with more flexibility in course selection and in the development of a personal timetable.

Carleton's alternative delivery media are cable television (itv) and videocassette. Course lectures are broadcast without restriction on cable television in the Ottawa area. For registered students living outside the metropolitan Ottawa cable area, course lectures can be accessed by special arrangement with itv's Tapes-to-You (TTY) Service for home delivery of course lecture tapes. Lectures may also be viewed on the Carleton campus or borrowed overnight from Instructional Media Services' Media Centre. Further information is available in the itv Brochure from Instructional Television or at the itv web site.

The Students

For the full-time or part-time degree or Special student, itv provides alternative access to courses particularly suited to a program of study, to which normal access may be otherwise denied because of timetable conflicts, space restrictions in on-campus sections or geographic distance from campus. As well, this service allows students to re-enter the education stream, earn credits needed to complete a degree, or test their suitability for university studies. Students registered in itv courses are expected to meet all University and Faculty requirements. These requirements may differ among the Faculties. Please refer to the Index for information specific to the various Faculties.

The Courses

An itv course is the full equivalent of the same course offered on campus. itv courses are either recorded live on campus or are offered as pre-recorded lectures. Students will complete the same assignments and examinations as the on-campus students, and in the same time period. All rights and responsibilities are the same as those that apply to on-campus courses. itv course sections are allotted the same support resources as those provided for on-campus sections.

Each itv course can count as credit towards a degree in the same way as the equivalent on-campus course. Generally speaking, appropriate itv courses successfully completed by Special students may be credited towards fulfillment of program requirements when the student is formally admitted to the degree or certificate programs.

Students enrolled in a degree program at another institution may take itv courses as Special students and transfer earned credits to their home university by means of a Letter of Permission. (See p. 45.)

Technology Requirements

Students who choose to enrol in a television section and who live within the broadcast area of the cable systems in metropolitan Ottawa must have access to a television set, a cable television converter, and cable television service to view and/or record lectures. It is suggested that they have access to a VCR as well. Those living beyond the reach of these cable systems and viewing course lectures on videocassette, need access to a VCR and a television set to view lecture tapes. Further information is available in the itv Brochure from Instructional Television or at the itv web site.

Associated Costs

The tuition for itv courses is identical to that for on-campus courses. Any other costs associated with credit courses such as textbooks, course manuals, course materials fees or lab fees are also the same. Additional costs may be incurred, for example, in the form of cable television charges, Tapes-to-You (TTY) Services or off-campus examination charges. All existing university charges may be applied to students enrolled in Instructional Television course sections. Tapes-to-You Services is available to eligible students who study at a distance.

Information pertaining to current charges for Tapes-to-You Services, including charges for TTY Arrangements, Off-Campus Examination Arrangements, and Service Deadlines are listed in the *Registration Instructions and Class Schedule* booklet, the itv Brochures and at the itv website at www.carleton.ca/itv/. Charges levied for service arrangements will be applied against the student's account with the University.

1. Tapes-to-You Service

Charges for service include delivery of course videocassettes to an individual student's address.

Note: The Tapes-to-You (TTY) service arrangements must be made before the deadlines for each academic term. (See above)

2. Late Registration Charges -Tapes-to-You Service

A Late Arrangement Charge will be levied for all Tapes-to-You (TTY) arrangements made in Late Registration periods as per deadlines noted for each academic term.

3. Itv Off-Campus Examination Arrangements

itv students who have arranged for Tapes-to-You service and live at a distance (160 km) from the university, may apply for off-campus examination service for each itv course in which they are registered.

A per course charge will be levied for this service where exams are written at off-campus locations. The charges for completed arrangements will be levied against the student's account with the University. Where available, students will be expected to write off-campus examinations at Examination Centres within 160 km of their local area.

4. Miscellaneous Charges

itv reserves the right to levy charges for administrative services such as change of delivery addresses, preparation of materials, and for the replacement video or print materials not returned.

For information pertaining to current charges, please refer to the itv website www.carleton.ca/itv or to the *Registration Instructions and Class Schedule* booklet published each July.

Academic Advising

Academic advising is available to Special students through the School of Continuing Education by telephone and in person. Degree students must consult the Registrarial Services office of their Faculty for further information about advising. This service provides orientation to university courses, course selection information and degree admission requirements.

English Language Requirements

University policy governing English language requirements for non-native speakers applies to all itv courses available for credit. (see p. 31).

Information about itv is available in person, by telephone, and in the itv Brochure available from Instructional Television.

The Faculties

- Arts and Social Sciences
- Academic Regulations: Arts and Social Sciences and Public Affairs and Management
- Engineering and Design
- Public Affairs and Management
- Science

Arts and Social Sciences

Academic Administration

Dean, B. Jones

Associate Dean (Undergraduate Academic Affairs), Mike Fox

Faculty Registrar, D. McKenna

Associate Dean (Research and Development), Aviva Freedman

Assistant Dean, Doug Saveland

Secretary of the Faculty Board, B.S. Elliott

Teaching Staff

Assistant Professor

George Pollard, B.A., M.A. (Carleton), Ph.D (Concordia)

Lecturer

Armand Ruffo, B.A. (York, Ottawa), M.A. (Windsor)

Instructor

Christine L. Adam, B.A. (Ottawa), M.A. (Carleton)

Other teaching staff can be found in the individual discipline listings.

Directory of Offices

Office of the Dean

330 Paterson Hall

Dean 520-2355

Associate Deans 520-2354

Faculty Registrar, 520-7460

Anthropology, see Sociology and Anthropology

Canadian Studies, P. Armstrong, Director 1206 Dunton Tower, 520-2366

Centre for Initiatives in Education, D. Forcese, Director 1419 Dunton Tower, 520-6624

English Language and Literature, L.T.R. McDonald, Chair 1812 Dunton Tower, 520-2310

Enriched Support Program, D. Forcese, Director 1419 Dunton Tower, 520-6624

French, D. Rosse, Chair 1602 Dunton Tower, 520-2168

Geography and Environmental Studies, Chair to be announced B349 Loeb Building, 520-2560

Environmental Studies, N. Doubleday

Co-ordinator, 520-2560 or 520-2600, ext. 8370

History, D. Gorham, Acting Chair
400 Paterson Hall, 520-2828

Humanities, P.C. Emberley, Director
300 Paterson Hall, 520-2809

Religion, J. Ramisch, Co-ordinator
2121 Dunton Tower, 520-2100

Institute of Interdisciplinary Studies, J.A. Brook, Director
2216 Dunton Tower, 520-2368 or 520-3597

Child Studies, T. Daniels, Co-ordinator, 520-2368

Cognitive Science, A. Laubstein, Co-ordinator, 520-6612 or 520-2802

Directed Interdisciplinary Studies, Charles Gordon, Co-ordinator, 520-2368

Languages, Literatures, and Comparative Literary Studies
R.L. Jeffreys, Director
1416 Dunton Tower, 520-2301

Linguistics and Applied Language Studies, I. Pringle, Director
215 Paterson Hall, 520-6612

Language Teaching, T. O'Brien, Assistant Director
215 Paterson Hall, 520-6613

Degree Programs, L. Young, Assistant Director
249 Paterson Hall, 520-2802

Philosophy, J. Drydyk, Chair
2123 Dunton Tower, 520-2110

Psychology, K. Matheson, Chair
B552 Loeb Building, 520-2648

Sociology and Anthropology, Chair to be announced
D795 Loeb Building, 520-2583

Studies in Art and Culture, B. Gillingham, Director,
423 St. Patrick's Building, 520-3993

Art History, Randi Klebanoff, Assistant Director
423 St. Patrick's Building, 520-2342

Film Studies, C. J. Faulkner, Assistant Director
423 St. Patrick's Building, 520-5606

Music, B. Gillingham, Assistant Director
A911 Loeb Building, 520-5770

Women's Studies, K. Arnup, Director
A812 Loeb Building, 520-6645

Degree and Certificate Programs

Specific information about course content, subject matter, and the structure of Honours or B.A. programs is obtainable from the academic departments within the Faculty.

The Faculty of Arts and Social Sciences offers programs in four degrees and four certificates.

Bachelor of Arts (Honours) and Bachelor of Arts (B.A.)

The four-year B.A. (Honours) provides rigorous and extensive study in one or two disciplines. The Honours degree is necessary for entry to certain fields of employment, and is a desirable preparation for graduate studies and professional training, including teaching.

The three-year B.A. program provides a liberal university education of value either as a general intellectual preparation for a great number of non-specialized careers, or as an introduction to subsequent specialized study.

Bachelor of Humanities (B.Hum.)

The four-year Honours program is a highly prescribed and intensive course of study in the core disciplines of the liberal arts. In addition to the prescribed core curriculum, students may choose one of four concentrations: Liberal Arts, History, Philosophy and Literature.

Bachelor of Music (B.Mus.)

The four-year Honours program prepares students for graduate studies in musicology and ethnomusicology, and gives an essential background for careers in music librarianship, music administration, and teaching. The program is offered by the Music discipline of the School for Studies in Art and Culture.

Certificate in English Language and Composition (C.E.L.C.)

This is a 5.0-credit post-degree certificate intended primarily for practising teachers, to upgrade their knowledge of areas of language and of writing theory that underlie the new Ontario guidelines. It is also open to persons without a degree who hold a teaching certificate. The program is offered by the Department of English Language and Literature.

Certificate in French Language Studies (C.F.L.S.)

This is a 6.0-credit program designed to permit people who already have some knowledge of French to achieve a high level of proficiency in the language. The program should be of particular interest to mid- and senior-level public servants, business people, teachers and other professionals as well as members of the general public. The program is offered by the Department of French.

Certificate in French Translation Studies (C.F.T.S.)

This is a 6.0-credit program designed to permit students to acquire and improve skills in translation from English to French. While it is not a professional program, this certificate should meet the needs of those who are occasionally called upon to translate in their work environment. The program is offered by the Department of French.

Certificate in the Teaching of English as a Second Language (C.T.E.S.L.)

This is a 5.0-credit program in the theory and practice of teaching English as a second language. The program is offered by the School of Linguistics and Applied Language Studies.

Part-Time Study

Part-time study is a viable method of attaining a degree in the Faculty of Arts and Social Sciences.

Part-time students who wish to limit their studies to evening and summer times should note that the following academic units teach a range of courses in the evening and during the summer that will permit students to complete a Major in their discipline.

Art History
Canadian Studies
English Language and Literature
Film Studies
French
Geography
History
Linguistics and Applied Language Studies
Music
Philosophy
Psychology
Religion
Sociology/Anthropology

Instead of giving unit names, it would make more sense to give the available Majors. Note, in particular, that not all Majors are in disciplines/units, for instance Criminology & Criminal Justice.

Students have the choice between full- and part-time registration and may alternate freely between the two.

Students wishing to pursue an Honours degree on a part-time basis are urged to consult with the appropriate academic unit(s) about the scheduling of courses.

Instructional Television

Instructional Television offers an alternative mode of access to courses offered at Carleton University. Your learning experience at Carleton University may include a mix of on-campus and television courses. For detailed information about *itv* refer to p. 57.

Academic Regulations:

Arts and Social Sciences and Public Affairs and Management

The Academic Regulations

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1.0 Administration of the Regulations

1.1 General Administration

The regulations on the following pages apply, except when noted, to all degree and certificate programs of the Faculty of Arts and Social Sciences and the Faculty of Public Affairs and Management and are administered by the Registrarial Services office of each faculty and the student's school or Major department. Students should refer to the listings for the programs administered by each faculty. Each Registrarial Services office provides an Academic Advising Service, and students are urged to seek advice on all questions about the regulations, and in particular before taking any action affecting promotion and probation, withdrawal, transfer of credit, review of grades, and change of Major or degree program.

As of 99/03/01, the courses over which the CI and the GPA are calculated are as defined below for all students, both continuing and newly admitted, in degree and certificates programs of the Faculty of Arts and Social Sciences and the Faculty of Public Affairs and Management.

1.2 Student Responsibility

Students are responsible for knowing and complying with the regulations and for registering in the courses required to fulfill degree requirements. Specific written permission must be obtained for exceptions to the regulations. Permission granted by a department must be confirmed by the appropriate Registrarial Services.

1.3 Requests and Petitions

Requests and petitions are made in writing to the student's Registrarial Services office, if possible on the forms provided and with relevant supporting documentation. Students should discuss their requests or petitions with an adviser. The circumstances of any request or petition are held in the strictest confidence.

Decisions on requests are made by the student's Registrarial Services office according to guidelines set by the Joint Committee on Admissions and Studies. Students may have such decisions reviewed by petitioning the Committee.

2.0 Admission, Readmission, and Degree Transfer

2.1 New Students

Detailed requirements for initial admission to degree and certificate programs are given on p. 31.

Admission with Advanced Standing

Students may be granted advanced standing on Admission on the basis of study completed at an accredited institution prior to admission. Students with advanced standing may be eligible for Second or higher Year standing (see 3.4). Academic Standing evaluations for students with advanced standing (see 5.7 and 5.8) will be based in part on the Statement of Standing on Admission.

Students with advanced standing on Admission must meet the applicable Residence Requirement (see 3.11) to obtain a degree or certificate from Carleton University.

2.2 The First-Year Curriculum

Registration in First Year

The First Year of study provides an essential foundation for later work. In order to ensure that they will be in a position to declare a Major (see 4.4), all students are required to include a minimum number of courses leading to a Major (see below) in their first 5.0 attempts (see 5.4).

Students in B.A. and B.A. (Honours) degree programs

Students in B.A. and B.A. (Honours) degree programs include a First-Year Seminar and courses leading to a Major in their first year program of study. B.A. and B.A. (Honours) degree students should also note the Breadth requirement (see below) and take it into account in planning their program of study.

First-Year Seminars

B.A. and B.A. (Honours) degree students include a First-Year Seminar during their first 4.0 credits of registration. A list of the First-Year Seminars can be found on p. 75.

Some First-Year Seminars count as courses leading to a Major.

Requirement for Breadth

To be eligible to graduate, students in B.A. and B.A. (Honours) degree programs must meet the requirement for Breadth. Students should consider this requirement in planning their registration. There are four breadth areas (see below) and students in the B.A. program must have at least 1.0 credit in each of three areas, while students in B.A. (Honours) must have an additional Breadth credit from any area, for a total of 4.0. Only 1.0 of these credits may be in a student's Major. The following table indicates in a general way how courses from various sponsoring units are distributed across the categories for breadth. More specific information for units identified as most or some is displayed in tables in each of the unit entries.

Breadth Area	Courses
Area 1: The temporal dimension of human societies, analyzing times before the present era or societies other than our own	Anthropology (some) Art History (some) Classics (most) Comparative Literary Studies (some) Economics (some) French (some) Geography (some) History (most) Institute of Interdisciplinary Studies (some) Law (some) Music (some) Philosophy (some) Religion (some)
Area 2: The artifacts of the imagination in literature and/or other forms; or the life of the imagination and culture	Anthropology (some) Art History (most) Art and Culture (all) Classics (Some) Comparative Literary Studies (most) English (most) Film Studies (all) French (most) German (all) Greek (all) Institute of Interdisciplinary Studies (some) Italian (all) Latin (all) Law (some) Linguistics and Applied Language Studies (some) Music (most) Philosophy (some) Religion (some) Russian (all) Sociology/Anthropology (some) Spanish (all) Women's Studies (some)

<p>Area 3:</p> <p>The understanding of social, technological and/or natural processes and the ways in which that understanding is obtained in science and social science</p>	<p>Architecture (all) Anthropology (all) Biology (all) Business (all) Canadian Studies (all) Chemistry (all) Classics (some) Computer Science (all) Economics (most) Environmental Science (all) European and Russian Studies (most) French (some) Geography (most) Geology (all) History (some) Industrial Design (all) Institute of Interdisciplinary Studies (most) Law (some) Linguistics and Applied Language Studies (most) Mass Communication (all) Mathematics (all) Music (some) Philosophy (some) Physics (all) Political Science (most) Psychology (all) Religion (some) Social Work (most) Sociology/Anthropology (most) Sociology (all) Technology, Society and Environment (all) Women's Studies (some)</p>
<p>Area 4:</p> <p>Matters of human values, ethics and social responsibilities.</p>	<p>Classics (some) History (some) Institute of Interdisciplinary Studies (some) Law (some) Philosophy (some) Political Science (some) Social Work (some) Sociology/Anthropology (some) Women's Studies (some)</p>

First-year students in all degree programs: Courses leading to a Major

First-year students in the B.A., B.A. (Honours), B.J., B.P.A.P.M., or B.S.W. degree programs must include in their registration at least one course leading to a Major in each of three departments, schools, disciplines or interdisciplinary areas within the Faculty of Arts and Social Sciences or the Faculty of Public Affairs and Management. Students should include in their First-year registration any course that is required for their prospective Major and should be aware that many upper-year courses stipulate prerequisites. Students in the B.J. program must also meet the First-year prescriptions of their programs.

Students in the B.Com., B.I.B., B. Hum. and B.Mus. programs must meet the First-year prescriptions of their programs and must include at least one course leading to a Major from each of two different departments, schools, disciplines or interdisciplinary areas within the Faculty of Arts and Social Sciences, the Faculty of Public Affairs and Management.

The courses open to First-year students that fulfill this requirement are:

- * *Art and Culture* 01.101
- * *Art History* 11.110★, 11.111★, 11.115★, 11.120★, 11.121★

- * *Biology* 61.103★, 61.104★
- * *Canadian Studies* 12.100
- * *European and Russian Studies* 01.102
- * *Economics* 01.103, 43.100
- * *English* 01.104, 01.105, 01.106, 18.100, 18.105, 18.162
- * *Film Studies* 19.100
- * *French* 01.147, 01.148, 20.145, 20.160
- * *Geography* 01.109, 01.110, 01.111 45.101, 45.102★, 45.103★, 45.105, 45.110★
- * *History* 01.112, 01.113, 01.145, all 100- and 200-level courses
- * *Law* 51.100
- * *Linguistics and Applied Language Studies* 01.126, 29.100
- * *Mass Communication* 01.127, 27.111
- * *Music* 30.101★, 30.102★
- * *Philosophy* 01.128, 01.129, 01.130, 32.101★, 32.102★, 32.150, 32.151★, 32.160, 32.184★, 32.201★, 32.203★
- * *Political Science* 47.100
- * *Psychology* 49.101★, 49.102★

* *Religion* 34.100 ★, 34.101 ★, 34.125 ★

* *Sociology/ Anthropology* 53.100, 54.100, 56.100

* *Women's Studies* 01.142, 01.143, 09.188

Note: There is no guarantee that every course will be offered each session. Please check the current Registration Instructions and Class Schedule for availability.

Course Selection

Subject to placement requirements, First-year students can choose 100-level courses from all departments in the Faculty of Arts and Social Sciences, the Faculty of Public Affairs and Management, and the Faculty of Science. Some departments will allow First-year students to take certain courses numbered at the 200-level.

While the University makes every effort to allow students to enrol in courses of their choice, enrolments are limited in many courses, including First-Year Seminars.

2.3 Readmission

Students in the following categories are required to apply for re-admission before registration. Readmitted students are governed by the regulations in effect at the first registration following re-admission.

(a) Students who, after graduation, wish to pursue a further degree;

(b) Students who have been absent from the University for two consecutive Fall/Winter sessions and the intervening Summer session;

(c) Students who have been admitted to a degree program and have taken courses at any other post-secondary institution since their last registration at Carleton (except students studying on a Letter of Permission from the appropriate Registrarial Services office);

(d) Students who have been Debarred. If readmitted, such students will be placed on Probation and will forfeit all previously passed courses with grades of less than C-.

Note: Applications for readmission are obtained from the Admissions Office and must be filed before June 30 for the Fall/Winter session and before April 1 for the Summer session.

2.4 Change of Degree Program

Applications to change degree programs must be made to the Office of Admissions by June 30 for the Fall/Winter session, by December 1 for the Winter term of the Fall/Winter session, and by April 1 for the Summer session.

Students who are transferring are governed by the regulations in effect at the first registration following the transfer.

Note: Transfer applications received during the month of July may not be processed in time for the student to take advantage of early registration.

3.0 Registration

3.1 Registration

Students must complete their registration, including fee payment arrangements, during the official registration periods shown for the session or term in the schedule for the Academic Year on p. 12.

3.2 Late Registration

Registration during the late registration period incurs a late registration charge. Registration is not permitted after the late registration period.

Students should note that mere attendance in a course does not constitute registration in that course.

3.3 Credit Value

Unless otherwise indicated, courses in the Faculties are of one full credit, indicated 1.0 on all records documents. Courses marked ★ are half-credits, indicated 0.5.

3.4 Definition of "Year"

Undergraduate students in the Faculty of Arts and Social Sciences and the Faculty of Public Affairs and Management (other than those admitted to Qualifying-University year) are given "Year" standing at the beginning of every Fall-Winter session according to the number of credits completed with passing grades and counting towards the degree or certificate.

The categories are as follows:

First Year:

Fewer than 4.0 credits successfully completed and counting towards the degree;

Second Year:

4.0 through 8.5 credits successfully completed and counting towards the degree;

Third Year:

9.0 credits through 13.5 credits successfully completed and counting towards the degree;

Fourth Year:

14.0 or more credits successfully completed and counting towards the degree and in an Honours degree program.

Students admitted to Qualifying-University year will be permitted to register with First-year standing upon successful completion of at least 4.5 credits towards the Qualifying-University year requirements, with the understanding that all outstanding Qualifying-University year requirements must still be met prior to graduation, in addition to the usual degree requirements.

3.5 Course Load

In the Fall/Winter session, students may register in up to five half-credits per term or equivalent, audited courses included.

In the Summer session, students may register in a maximum of 2.0 credits during the session, including audited courses.

3.6 Course Overload

Permission of the student's Registrarial Services office is required to register in a course overload. Such permission is automatically provided at the end of the assigned registration schedule to students whose CI is 7.00 or higher (see 5.6 for the definition of the CI). The maximum load permitted is six half-credits per term in the Fall/Winter Session and three half-credits per term in the Summer session.

3.7 Auditing

Students may, with the permission of the academic unit, register in some courses as auditors. (See p. 45 for details.) Auditors receive no grade and no credit for the course. No change from credit to audit or from audit to credit will be permitted beyond the last day for course changes in any course.

3.8 Change of Course and Section

Changes of course, or of section within a course, must be done through the telephone registration system on or before the deadlines specified on p. 12.

3.9 Withdrawal

Students withdrawing from courses or from their entire program must phone the telephone registration system on or before deadlines specified on p. 12. Students receiving scholarships or financial assistance must consult the Awards Office before dropping courses. Students wishing to withdraw from a First Year Seminar must consult with an Academic Advisor in their Registrarial Services Office.

For Summer session 1999 see the Summer Session Supplement.

For Summer session 2000 see the Academic Year p. 12.

Note: The onus for officially withdrawing by the telephone registration system rests solely with the student. Ceasing to attend lectures or informing the instructor does not constitute withdrawal, and will result in an *Abs* or grade of *F*.

3.10 Courses from Other Faculties and Schools

Students must consult their Registrarial Services office about registering in courses in Engineering, Industrial Design, and Architecture. Science and interdisciplinary courses are generally acceptable. Professional courses in Engineering, Industrial Design and Architecture are generally not acceptable. Performance courses in Music are open only to students in certain Music programs. Professional courses in Journalism are not acceptable options in the B.A. program. A limited number of Architecture courses are permitted in certain programs. Students who wish to take courses in Engineering, Industrial Design, and Architecture which are not part of their program or which are not listed as being open to students in the Faculty of Arts and Social Sciences and the Faculty of Public Affairs and Management, must obtain prior permission from the Department(s) of their Major, and from the unit offering the course.

3.11 Residence Requirement

Degree Programs

To obtain a degree from Carleton University, students must present a minimum of 5.0 credits taken at Carleton and counting toward the degree. Departments may require that certain of these credits be at the senior level. These 5.0 credits must include credits as follows:

B.A.: 3.0 credits in the Major;

Honours Programs: 4.0 credits in the Major, including the Honours thesis or essay or comprehensive examination where it is a requirement of the program;

Combined Honours Programs: 3.0 credits in one Major and 2.0 credits in the other, the 5.0 credits to include the Honours research project where it is a requirement of the program.

Certificate Programs

To obtain an undergraduate Certificate from Carleton University, students must present a minimum of 4.0 credits taken at Carleton, including all core courses required for the certificate.

Minor

To obtain an undergraduate Minor designation from Carleton University, students must present a minimum of 2.0 credits in the Minor taken at Carleton.

Multiple Undergraduate Degrees

Students admitted to a second undergraduate program must, in addition to meeting the requirement described above, present a minimum of 5.0 credits for the new degree program (4.0 in a certificate program) taken at Carleton and not counted for any previous program. These must include 3.0 credits in the Major of the new degree program (4.0 in an Honours program for students whose previous degree was not completed at Carleton). Variations

from this pattern may, in very exceptional circumstances, be approved by the Joint Committee on Admissions and Studies. Students should consult their Registrarial Services Office.

3.12 Transfer of Credit

Transfer of Credit After Admission (not with the University of Ottawa)

Before taking courses at another university, students must obtain prior written authorization from their Registrarial Services office. Such authorization may be a Letter of Permission to study at another degree granting University or Institute, or authorization to participate in an Exchange Agreement (see 3.13).

Students who take courses without obtaining prior written authorization will not be granted credit for the courses. Permission obtained from an instructor or from a department does not constitute authorization.

Eligibility:

To be granted permission, students must:

- (a) have completed at Carleton a minimum of 4.0 credits counting towards their degree program; and
- (b) be a Declared Major; and
- (c) be in Good Standing (see 5.7 and 5.8); and
- (d) meet any other specific requirements of an Exchange. (See also 3.11 Residence Requirement.)

Note: Authorization to study elsewhere for transfer of credit is issued only to students in Good Standing. Letters of Permission conditionally granted for Summer session courses will be revoked if students do not attain Good Standing in the Academic Standing evaluation at the end of the Fall/Winter session.

For other sessions of registration, students must meet the requirements for Good Standing and be continuing at that level of performance, as determined by the Registrarial Services office.

Maximum Load

Subject to the regulations of the host university, a Carleton student studying elsewhere for transfer of credit may take a maximum of 2.0 credits in the Summer and 5.0 credits in the Fall/Winter session.

Application and Fees

(a) Applications for permission to study elsewhere for transfer of credit must be obtained from the student's Registrarial Services Office. Applications must be returned to that office accompanied by a photocopy of the official description of the course.

(b) Applications must be made by November 15, for January registration; March 31, for Summer registration and July 31, for September registration.

(c) A processing fee is charged for Letters of Permission. Students should note that this is a per-fourse, not a per-credit fee.

Reporting

(a) Students who find it necessary to have the terms of their authorization amended must notify their Registrarial Services office prior to the completion of the courses in question.

(b) Students are required to present their Registrarial Services office with an official transcript showing results in courses authorized for transfer of credit. If a transcript is not forthcoming, the course(s) will be awarded a failing grade.

(c) Students completing their final credit(s) for a degree by transfer of credit are warned that transfer grades may not be available in time for graduation.

Transfer Credit Grading

- (a) Grades for successfully completed courses will not be transferred.
- (b) Students must obtain a minimum grade of C- (or higher if the Major department or the student's Registrarial Services office so stipulates). The student shall be notified of such a requirement when the authorization for transfer of credit is issued.
- (c) Credit will not be transferred for courses with passing grades below the minimum required.
- (d) Failing grades will count as unsuccessful attempts in all assessments of eligibility to register and graduate and will be included in the calculation of the CI (see 5.4 and 5.6).
- (e) Students studying elsewhere for transfer of credit are not eligible to take Supplemental or Grade-Raising examinations if offered at the host institution.

3.13 Exchange Agreements

Students in Good Standing (see 5.2) may be eligible to study elsewhere on one or more of the many exchange agreements available to undergraduate students. For details on Transfer of Credit regulations, see 3.12.

The University of Ottawa Exchange Agreement

Carleton undergraduate students may register to take courses at the University of Ottawa to be credited to their Carleton degree. The following regulations apply:

1. Students must be registered in a degree program at Carleton and must be in Good Standing (see 5.2).
2. Only courses to be credited as part of degree requirements at Carleton may be taken under the terms of the exchange.
3. At any time, the cumulative total of courses taken by the student at Carleton and counting toward the degree must be greater than the total number of courses taken at the University of Ottawa and counting toward the degree. In the case of first year studies, a maximum of 1.0 credit (6.0 credits U of O) may be taken at the University of Ottawa that year.
4. Courses taken under the Exchange Agreement will not satisfy the residence requirement for students' degree and Major programs (3.11).
5. Grades for courses taken on the Exchange Agreement will be reported on the Carleton transcript and will be included in the calculation of the CI and GPAs.

Students should consult their Registrarial Services office for application forms and information on procedures and deadlines.

Students should note that space in courses may be limited and therefore applications should be filed as early as possible.

Students withdrawing from an exchange agreement course(s) must notify their Registrarial Services Office by the appropriate deadlines, or a grade of *Ab* or *F* may be recorded. There may be financial implications.

International Exchange Agreements

Eligible students may take advantage of other Exchange Agreements with Universities around the world. Interested students should consult their Registrarial Services office and Carleton International, 1506 Dunton Tower, for further information. Enquiries should be made at least one year in advance of the proposed exchange.

3.14 Student Records

Incorrect address information will delay the receipt of awards, and notification of changes in academic status. Addresses must include postal codes. Students must notify their Registrarial Services office immediately of any change in:

- (a) permanent or home address (used for registration information);
- (b) local address (used for all mail during the academic session);
- (c) telephone number for permanent address and for local address;
- (d) name.

3.15 Challenge for Credit**Degree Programs**

A student with significant work-related experience and non-academic learning equivalent to a specific Carleton course may receive credit for that course through the Challenge for Credit procedure. If the University is satisfied that a student is adequately grounded in a course, credit may be granted by examination, without the normal requirements of attendance and instruction. Not all departments participate in this procedure. There is a charge for each challenge. A student may present no more than 5.0 challenged credits in a degree program. Students must enquire at their Registrarial Services office.

Credits obtained by challenge may be not used to satisfy the Residence Requirement for the student's degree program and Major discipline (see 3.11).

Certificate Programs

A student may challenge up to 1.0 credit in an undergraduate Certificate. Students must enquire at their Faculty Registrarial Services office.

3.16 Re-registration in the Honours Research Project

When a unit Calendar entry refers to this section of the regulations, then these principles of re-registration apply to the Honours Research Project in that unit's program (no matter what name it is given). Otherwise, these rules do not apply.

General

Although the scope of the Honours Research Project should not exceed what the student can reasonably expect to complete within an academic session (either Fall/Winter or Summer), up to two re-registrations are permitted in consecutive sessions. If the Honours Research Project is not completed within three consecutive sessions, whether or not registration occurred in all three, a grade of *F* will be assigned.

The first re-registration is optional for students whose Honours Research Projects are still outstanding at the beginning of the second session. Students should note, however, that they are not eligible for supervision or library privileges, may not submit an Honours Research Project for grading, and may not graduate if they are not registered.

The second re-registration is compulsory for students whose Honours Research Projects are still outstanding at the beginning of the third session. To avoid such re-registration students must either:

- (a) withdraw from the Honours program, notifying their Registrarial Services office of their intention in writing, no later than the last date for late registration; or
- (b) notify their Registrarial Services office of intention to complete

the Honours program by means of appropriate alternative courses approved by the Honours supervisor.

For the initial registration, the fee per credit applies. For each re-registration the fee per half credit applies.

Deadlines for Submission of the Honours Research Project

The deadline for submission of the Honours Research Project is the last day for handing in term assignments for the session of registration, subject to any earlier course deadline (see the schedule for the Academic Year, p. 12).

Students who are in their initial registration or their optional first re-registration, and who have not applied to graduate, may submit the Honours Research Project no later than the last day of the examination period for the session of registration (see the schedule for the Academic Year, p. 12).

If the Honours Research Project is not submitted by the appropriate deadline, a notation of IP will be assigned for those students eligible to re-register. A grade of F will be assigned for those students not eligible to re-register.

Withdrawal

Students may withdraw from the Honours Research Project up to the last date for withdrawal from full courses in the session. Students who withdraw during their initial registration or first re-registration may retain standing in the Honours degree program. Students who withdraw from the second re-registration will forfeit standing in the Honours degree program, unless they simultaneously transfer to another course or courses that meet Honours requirements. Students who withdraw from the Honours program will automatically be withdrawn from the Honours Research Project.

Reinstatement

Students who fail to complete the Honours Research Project successfully within the three consecutive sessions permitted will forfeit Honours status, but may apply to the Joint Committee on Admissions and Studies for reinstatement in the Honours program. Reinstatement is not guaranteed. The department may require such students to begin a new project. Reinstated students will pay a full registration fee.

Eligibility to Graduate

Some units require that students meet a published minimum grade in the Honours Research Project in order to establish eligibility to graduate in the Honours degree program. See departmental listings for details.

4.0 Degree Program Structure

Carleton University provides structured choice in its undergraduate degrees, in the form of Majors and program options.

a) The Major

Every student in the Faculty of Arts and Social Sciences and the Faculty of Public Affairs and Management is required to identify an area of study called the Major, which is displayed on both the transcript and the diploma awarded at graduation.

Some areas of study are given in separate degrees (for instance, students majoring in Business earn the B.Com. degree and those majoring in Social Work earn the B.S.W. degree) while the rest are offered within the B.A. and B.A. (Honours) degree programs. Areas of study can be within a discipline or in an interdisciplinary program. Students in the B.A. (Honours) degree program may also pursue a Combined Major, with two different focuses.

In the B.A. degrees, the Major determines additional graduation requirements beyond those of the degree program. Furthermore, being a Declared Major may be a prerequisite for some required courses and is normally required for Good Standing after First Year.

Academic advising on the B.A. degree programs is provided by the Registrarial Services office. Academic advising on Majors, including those offers as separate degrees) is normally offered by the department, College or other academic unit which offers or oversees courses in the Major.

b) Program options

i. The Minor

A student may pursue a Minor in an area of study which complements or supplements the Major. Minors sponsored by units offering B.A. and B.A. (Honours) degrees normally consist of 4.0 credits. Courses may not be counted towards both a Major and a Minor. Students may declare a Minor at any point in their academic career, so long as they meet the stated entrance requirements for the Minor. Application deadlines should be closely followed. Students should note that some combinations of Majors and program options may require that a student take courses in excess of the 15.0 or 20.0 credits normally required for the degree. The unit offering the Minor is the primary source of academic advice for students about the Minor.

ii. The Concentration

A student may pursue a Concentration within some Majors, representing an area of focused study within the Major. Students may apply to enter a Concentration within their Major at any point in their academic career, so long as they meet the stated entrance requirements for the Concentration. Application deadlines should be closely followed. The unit(s) offering the Concentration is/are the primary source of academic advice for students about the Concentration.

iii. The Specialization

In the B.A. degree programs, a student may pursue a Specialization designation within some Majors, indicating that the student has completed a highly structured, Senate approved program which features both a Major and a special set of designated required courses outside the Major. The unit(s) offering the Specialization is/are a primary source of academic advice for students regarding the Specialization.

In the B.P.A.P.M. degree program, students are required to select a Specialization by the time they become eligible for second year standing. This Specialization is an area of focused study which complements the core requirements of the Major. The primary source of advice regarding the B.P.A.P.M. Specializations is the office of the College of Public Affairs.

(c) Interdisciplinary and Multidisciplinary Majors

The general regulations for the B.A. and B.A.(Honours) degree programs apply to Interdisciplinary and Multidisciplinary Majors. The requirement for Breadth is modified for some of these Majors.

The Institute of Interdisciplinary Studies offers several Interdisciplinary Majors including Directed Interdisciplinary Studies, within the B.A. degree programs. Students are urged to declare these Majors as early as possible. In the case of Directed Interdisciplinary Studies, special application forms (available from the Institute office) are required and special deadlines for submission apply.

Other multidisciplinary Majors within the B.A. degree programs include Criminology and Criminal Justice, Human Rights, Environmental Studies, European and Russian Studies, History and Theory of Architecture, Art and Culture, Canadian Studies.

4.1 Programs and Program Options Offered

This is an inclusive list of the programs and program options offered in the Faculty of Arts and Social Sciences and the Faculty of Public Affairs and Management.

Not all combinations of programs and program options are acceptable — students must consult the Registrarial Services office for details.

The following are the names of available Major programs within the B.A. degree:

Major Program	Comments
Art History	
History and Theory of Architecture	
Biology	
Canadian Studies	Mention: français available
Child Studies	requires courses at Algonquin
Criminology & Criminal Justice	requires a Concentration
D.I.S.	
Economics	
English	
Environmental Studies	
Film Studies	
French	
Geography	
History	Mention: français available
Law	Concentration available
Linguistics and Applied Language Studies	Mention: français available
Mass Communication	
Music	
Philosophy	Mention: français available
Political Science	Mention: français available Concentrations available
Psychology	Mention: français available
Religion	
Sociology/Anthropology	Mention: français available
Women's Studies	requires a Minor

The following are the names of Major programs within an Honours degree. Usually this is the B.A.(Honours) unless another degree name is specified in brackets. Combined means that Combined Honours programs are available in this Major.

Major	Comment
Anthropology (Combined)	Mention: français available
Art History (Combined)	
Art and Culture	
Biology (Combined)	
Business [B.Com.]	
[B.I.B.]	Concentration available
Canadian Studies (Must be Combined)	Mention: français available
European and Russian Studies (Combined)	requires a Concentration
Child Studies	requires courses at Algonquin
Cognitive Science	
Criminology and Criminal Justice	requires a Concentration

Directed Interdisciplinary Studies	
Economics (Combined)	Concentration available
English (Combined)	
Environmental Studies	
Film Studies (Combined)	
French	
Geographic Information Processing	
Geography (Combined)	Concentration available
History (Combined)	Mention: français available
Human Rights (must be Combined)	
Humanities [B.Hum.]	Concentration required
Journalism [B.J.] (Combined)	
Law (Combined)	Concentration available
Linguistics and Applied Language Studies (Combined)	Mention: français available
Mass Communication (Combined)	
Music [B.Mus.]	
B.A. (Combined)	
Philosophy (Combined)	Mention: français available; Specialization available
Political Science (Combined)	Mention: français available; Concentration available
Psychology (Combined)	Mention: français available
Public Affairs and Policy Management [B.P.A.P.M.]	Specialization required
Religion (Combined)	
Social Work [B.S.W.]	
Sociology (Combined)	Mention: français available; Concentration available
Women's Studies (must be Combined)	

The following are the names of available Minor programs:

Minor	Comment (see 4.4)
Anthropology	GPA 4.0
Art History	GPA 4.0
Business	see unit listing
Canadian Studies	GPA 6.5
Classics	GPA 4.0
Economics	GPA 4.0
Educational Linguistics	GPA 6.5
English	GPA 4.0
Film Studies	GPA 4.0
French	GPA 4.0
Geography	GPA 4.0
Geography: Geographic Information Processing	GPA 6.5
Geography: Physical Geography	GPA 6.5
Geography: Resource and Environmental Assessment	GPA 6.5
History	GPA 4.0
Japanese	GPA 6.5
Law	GPA 4.0
Mass Communication	see unit listing
Mathematics	GPA 4.0
Music	GPA 4.0
Philosophy	GPA 4.0

Political Science	GPA 4.0
Psychology	GPA 4.0
Religion	GPA 4.0
Sociology	GPA 4.0
Statistics	GPA 4.0
Women's Studies	GPA 4.0

4.2 How and when to declare a Major program or a program option

Students may state their interest in most programs or program options at the time of application for admission. When admitted to their program or program option, students are said to be 'Declared' and they continued to be called 'Declared' so long as they retain their status in the program or program option.

a. The Major

i. Majors in the B.A. and B.A. (Honours) Programs

Students admitted to the B.A. and B.A. (Honours) degree programs are encouraged to declare their Majors by the time of their first registration. Students may also apply to declare or change their Major at their Registrarial Services office according to the deadlines published in the Calendar.

Being a Declared Major is a requirement for an Academic Standing evaluation of 'Good Standing' (see 5.2) for all students eligible for Second-Year (or higher) Standing (see 3.4).

With reference to the Major only, students are said to be 'Undeclared' if they have not applied to Declare a Major, or if their application has not been approved, or if they have been removed from their Major and have not yet declared another in its place.

All students in B.A. and B.A. (Honours) degree programs must be Declared Majors at the time of the first Academic Standing evaluation following Admission (see 5.3). Students eligible for Second-Year Standing (see 3.4) who are not Declared Majors must obtain special permission from Registrarial Services to register. Such permission is normally available only to students who have met the First Year course distribution requirement (see 2.2).

Students in a B.A. or B.A. (Honours) program who are eligible for Third or higher Year Standing and who cannot declare a Major, will be Debarred (see 5.2).

ii. Majors offered as separate degrees

Students normally apply to be admitted directly to the First Year of Majors offered as separate degrees (B.J., B.Com., B.I.B., B.Mus., B.P.A.P.M., B.S.W., B.Hum.). Students may apply through the Office of Admissions to transfer into or out of these programs (see 2.4) but as most of these programs are subject to enrolment limitations, entry will be competitive. Consult the appropriate departmental entries for further details.

(b) Other program options

Students may apply to the Registrarial Services office to be admitted to program options during their first or subsequent years of study. Acceptance into program options is subject to any specific requirements of the intended Minor, Concentration or Specialization as published in the relevant Calendar entry. Students declaring more than one program option must meet the requirements in each. Students must be in Good Standing to declare any program option. Not all combinations of Majors and program options are permitted.

4.3 The Grade Point Average (GPA)

A Grade Point Average (GPA) is one of the basic measures of academic success. It plays a central role in continuation in the Major and in program options and it is the basis for establishing academic

standing in the Major. Except in special circumstances, a GPA is cumulative across the years of study.

A GPA is calculated by dividing the total Grade Points accumulated from the specified set of courses by the number of credits obtained in that set of courses. The GPA is calculated to one decimal place and is not rounded.

Where the academic record includes repeated courses and/or Supplemental or Grade-raising examinations (no longer offered), only the most recent attempt will be included in the GPA. Forfeited courses will be excluded from the GPA calculation as will all courses noted as ETD or NCD.

a. GPA in the Major

The GPA for entry into and continuation in a Major will be calculated over all successful graded attempts in courses in the Major counting towards the degree. The GPA in the Major for a second or subsequent degree will not include courses used to meet the program or option requirements of a previously awarded degree.

Once eligibility to graduate has been established, the class of degree to be awarded is determined by the GPA regulations in sections 7.3 and 7.5.

b. GPA in a program option

The GPA in a Minor, Concentration or other program option will be calculated over all successfully completed, graded courses counting towards the program option.

4.4 Standards for Declaration and Continuation

Acceptance into a Major program or into a program option is subject to any specific requirements of the program or program option as published in the relevant Calendar entry.

a. Major programs not subject to enrolment limits

To be accepted into a Major not subject to enrolment limitations, students who are eligible for First-Year Standing (see 3.4) declare the Major at their Registrarial Services office. Students who are eligible for Second-year or higher standing (see 3.4) must have completed at least one course leading to the desired program or must be enrolled in such a course to declare the Major.

If a GPA in the Major can be calculated, that GPA must meet or exceed the minimal Graduation standards for the degree. Students in the B.A. program must achieve a GPA of 4.0 or better in order to declare the Major and retain standing as a Declared Major at the time of each subsequent Academic Standing evaluation. Students in the B.A. (Honours) program must achieve a GPA of 6.0 or better (6.5 or better if eligible for Fourth-year standing) to declare the Major and to retain standing as a Declared Major at the time of each subsequent Academic Standing evaluation.

b. Major programs subject to enrolment limitations

Acceptance into, and continuation in programs subject to enrolment limitations, is governed by standards which are set out in detail in the relevant departmental entries. Currently the programs subject to limitations are Business, Humanities, International Business, Journalism, Mass Communication, Music, Public Affairs and Policy Management and Social Work.

c. Program options

To be accepted into a program option, students who are eligible for First-year Standing (see 3.4) must declare the program option at their Registrarial Services office. Students who are eligible for Second-year or higher standing (see 3.4) must have completed at least one course leading to the desired program option or must be enrolled in such a course.

If standards for admission to a program option are not specifically set by the sponsoring unit in its Calendar entry, then the continuation standards described in paragraph (i) and (ii) shall be used as admission standards.

i. Type 1 program options

If a GPA for the program option can be calculated, that GPA must be 4.0 or better in order to retain standing in the program option at the time of each subsequent Academic Standing evaluation.

ii. Type 2 program options

If a GPA for the program option can be calculated, that GPA must be 6.5 or better in order to retain standing in the program option at the time of each subsequent Academic Standing evaluation.

Currently the type 2 program options are the Minors in Canadian Studies, Geographic Information Processing, Educational Linguistics, Japanese, and the Concentrations in Business Law, Law, Policy and Government, Power and Everyday Life, and Applied Social Research.

iii. Type 3 program options

Acceptance into and continuation in the Minors in Business and Mass Communication are governed by local standards which appear in the appropriate unit entries.

5.0 Academic Standing

5.1 Standing in Courses

Standing in courses is shown on the academic record by alphabetical grades as described on p. 47.

(a) In addition, the following symbols apply in the Faculty of Arts and Social Sciences and the Faculty of Public Affairs and Management:

Abs

Absent from formally scheduled final examinations where the necessary term work has been completed. (See also 5.4.)

Aeg

Pass standing granted on the basis of course work when no further assessment is considered feasible. Aegrotat is granted only by approval of the Joint Committee on Admissions and Studies in response to a student's application. (See also 6.3.)

Ch

Credit granted under the Challenge for Credit policy.

Def

Final grade deferred for personal or medical reasons with approval of the Joint Committee on Admissions and Studies. Non-completion of the deferred work may lead to an academic penalty.

F

Failure, no academic credit.

IP

Honours Paper or Research Essay is In Progress. (See 3.16)

Sat

Passing performance in courses graded *Sat/Uns*

Uns

Failing performance in courses graded *Sat/Uns*

(b) The following symbols serve to identify other courses which do not count towards the current degree in the Faculty of Arts and Social Sciences and the Faculty of Public Affairs and Management.

Aud

Audit indicates courses attended but not taken for academic credit.

ETD

A course passed prior to graduation but not counted towards the degree.

FORFEIT

This designation identifies passed courses for which credit is not given as a result of regulatory decisions.

NCD

A course not acceptable for credit towards the current degree.

5.2 Academic Standing Categories

Performance of all students will be evaluated regularly to determine whether they are meeting the standards prescribed for continuing in their program. Performance will be classified according to the following three categories:

Good Standing

Students in Good Standing fully meet the academic standards prescribed for their degree program and are eligible to continue in that program (see 5.7 and 5.8.)

Probation

Students placed on Probation are deficient with respect to the academic standards prescribed for their degree program. They may continue in their degree program but must clear Probation at the time of their next Academic Standing evaluation (see 5.7 and 5.8.)

Debarred from Further Study

Students whose performance falls below a minimum standard will be debarred. Students who are debarred will not be eligible to register at Carleton University (see 5.7 and 5.8.)

5.3 Schedule of Academic Standing Evaluations after Admission

The first evaluation of Academic Standing will take place at the end of the session of Fall/Winter registration in which students have accumulated a total of at least 4.0 attempts.

Subsequent evaluations will take place at the end of each successive Fall/Winter registration, providing that students have made at least 2.0 attempts since the previous Academic Standing evaluation. Students admitted with advanced standing on the basis of previous post-secondary study will receive an Academic Standing evaluation providing that they have made at least 4.0 attempts since admission.

Students who have been granted Deferrals in one or more courses may have their Academic Standing evaluation delayed until the Summer session is in progress. Grades earned in the Summer Session will not affect Academic Standing evaluations postponed because of Deferral.

5.4 Attempts

Every grade which appears on the official transcript or credit which appears on the Statement of Standing on Admission constitutes an attempt (see 5.4). Attempts are weighted according to the credit value of the course. Courses accepted for transfer of credit and taken on a Letter of Permission (see 3.12) are attempts as are courses noted as *ETD*.

Honours Paper or Research Essay grades of *IP* and unsuccessful Challenges for Credit are not attempts, nor are courses with the notations *NCD*, *Aud* or *Wdn*.

Unsuccessful attempts are grades not counting towards students degree requirements and not designated as either *NCD* or *ETD*. All of the following failures are unsuccessful attempts: grades of *Uns*, *Abs*, *F* (or *FNS*, no longer given); failed courses taken on a Letter of Permission. The following forfeitures are also unsuccessful attempts: grades forfeited as a result of Probation (see 5.7 and 5.8); grades forfeited through preclusion; grades forfeited on admission as recorded on the Statement of Standing on Admission;

grades which are replaced through Grade-raising examinations (no longer given) or course repetition, including repetitions of courses taken on a Letter of Permission.

5.5 Limit on Unsuccessful Attempts

Students in the B.A. program may not accumulate more than 8.0 unsuccessful attempts (including those on the Statement of Standing on Admission) in the process of earning their degree. Students who accumulate more than 8.0 unsuccessful attempts will be debarred.

Students in Honours programs may not accumulate more than 6.0 unsuccessful attempts (including those on the Statement of Standing on Admission) in the process of earning their degree. Students who accumulate more than 6.0 unsuccessful attempts must withdraw from Honours and may be debarred if they cannot transfer to the B.A. program.

Students in 5.0 or 6.0 credit certificate programs may not accumulate more than 2.0 unsuccessful attempts (including those on the Statement of Standing on Admission) while earning their certificate.

5.6 Continuation Index (CI)

Academic Standing evaluations will be based in part on the Continuation Index, the CI. The CI begins on admission to a degree program in the Faculty of Arts and Social Sciences and the Faculty of Public Affairs and Management and continues until a student graduates or transfers to another degree program, except in the case of students transferring between the B.A. and B.A. (Honours) degree programs. Special rules apply in the case of students placed on Probation (see 5.7 and 5.8).

The CI is calculated by dividing the total grade points accumulated over all attempts by the total number of attempts (see 5.4). The calculation is carried to two decimal places and is not rounded.

Since the passing grades of Ch, Sat and Aeg and credits obtained through Letters of Permission do not generate grade points, courses with these grades and the attempts associated with them will be ignored in the calculation of the CI. Audited courses, grades of *IP*, notations of *Wdn* and the 0.0 credit required courses in Music are also ignored in the calculation of the CI.

5.7 Academic Standing in the B.A. Program

Good Standing

Students in the B.A. program will be in Good Standing at the time of any Academic Standing evaluation if:

- (a) their CI over all attempts is at least 4.00; and
- (b) they have accumulated no more than 8.0 unsuccessful attempts; and
- (c) when eligible for Second-Year or higher Year Standing (see 3.4), they are Declared Majors and have a GPA of 4.0 or more in each Major.

Probation

Students in the B.A. program will be placed on Probation at the time of any Academic Standing evaluation if their CI is less than 4.00 but greater than 1.00. Students not in First Year are eligible for Probation only if they are Declared Majors.

Students placed on Probation will immediately forfeit all passed courses with grades of less than C- accumulated during the evaluation period which resulted in Probation. Students on Probation are not eligible to participate in exchange programs or to study abroad, are not eligible for Letters of Permission and are not eligible to declare program options.

Students on Probation must clear Probation at the time of their next Academic Standing evaluation by attaining Good Standing. This requires being a Declared Major (if students are eligible for Second- or higher Year Standing (see 3.4) as well as achieving a CI of 4.00 or more over all attempts accumulated during the period of Probation. Students failing to meet these standards will be Debarred.

The CI for all subsequent evaluations concerning academic standing and graduation in the students' degree program will be calculated over the attempts accumulated after being placed on Probation. Unsuccessful attempts accumulated prior to the Probation decision will continue to be counted in the total allowed for the degree (see 5.5).

Students may not go on Probation more than once. If their CI falls below 4.00 a second time, students will be Debarred.

Debarred from Further Study

Students in the B.A. program will be Debarred at the time of any Academic Standing evaluation, if any of the following is true:

- (a) their CI is less than 1.00; or
- (b) having previously been placed on Probation, they fail to obtain Good Standing; or
- (c) having cleared Probation, they subsequently fail to maintain Good Standing; or
- (d) they accumulate more than 8.0 unsuccessful attempts; or
- (e) when eligible for Second Year Standing (see 3.4), they are not a Declared Major and fail to qualify for permission to register Undeclared;

or

- (f) when eligible for Third-Year or higher Standing (see 3.4), they are not a Declared Major, or having lost standing as a Declared Major in one area of study, they do not qualify to declare another Major.

5.8 Academic Standing in the B.A. (Honours), B.Com., B.Hum., B.I.B., B.J., B.Mus., B.P.A.P.M. and B.S.W. Programs

Note: Students in the B.Com., B.Hum., B.I.B., B.J., and B.P.A.P.M. programs should note that these programs have established different criteria regarding entry, continuation and degree program transfer. Consult the relevant listings for details.

Good Standing

Students in Honours programs will be in Good Standing at the time of any Academic Standing evaluation if:

- (a) their CI over all attempts is 5.00 or better in B.A. (Honours) and B.Mus., 6.0 or better in B.Com., B.Hum., B.I.B., B.J., and B.S.W. programs; and 7.0 or better in the B.P.A.P.M. program; and
- (b) they have accumulated no more than 6.0 unsuccessful attempts; and
- (c) when eligible for Second- or Third-year Standing (see 3.4), they are Declared Majors and have a GPA of 6.0 or more in each Major (a GPA of 6.5 or more is required of Third-year students in the B.I.B.); or
- (d) when eligible for Fourth-year Standing (see 3.4), they are Declared Majors and have a GPA of 6.5 or more in each Major.

Loss of Good Standing in Honours

Disciplines Offered as Separate Degrees

Students who are removed from disciplines offered as separate degrees must apply to the Office of Admissions to determine

eligibility for admission to another degree program.

B.A. (Honours), B.Mus., B.S.W.

(a) Transfer to the B.A. program

In most circumstances, it is advantageous for B.A. (Honours) students to accept transfer to the B.A. program, if they receive an unfavourable Academic Standing evaluation. Students whose performance meets or exceeds the minimum standards for continuation in the B.A. program will normally be transferred to that degree program and will receive an Academic Standing evaluation based on the criteria for that degree program.

(b) Probation in Honours

In rare circumstances, it is to the students' advantage to undertake Probation in Honours rather than accept transfer to another degree program. This choice is only available to students whose CI is greater than or equal to 4.00 and who qualify to be a Declared Major.

Students who choose to be placed on Probation in Honours will immediately forfeit all passed courses with grades of less than C (in B.A. (Honours) and B.Mus., C+ in B.S.W.) accumulated during the evaluation period which resulted in Probation. Students on Probation are not eligible to participate in exchange programs, are not eligible for Letters of Permission, and cannot declare any program options.

Students opting for Probation in Honours must contact both their Major Department and their Registrarial Services office for advice and must file a formal request for this status with their Registrarial Services office.

The CI for all subsequent evaluations concerning Academic Standing and Graduation will be calculated over the attempts accumulated after being placed on Probation. Unsuccessful attempts accumulated prior to the Probation decision will continue to be counted in the total allowed for the degree (see 5.5).

Clearing Probation in Honours programs

Students who are on Probation in Honours programs must clear Probation at the time of the next Academic Standing evaluation by attaining Good Standing. This requires achieving an appropriate CI (5.00 or better in B.A. (Honours) and B. Mus. programs and 6.00 or better in the B.S.W. program) over all attempts accumulated during the period of Probation, as well as retaining status as a Declared Major. Students in B.A. (Honours) failing to meet this standard will be evaluated for transfer to the B.A. program. If their performance during the Probation period meets or exceeds the minimum required for Good Standing in the B.A. program and if they qualify to be a Declared Major, they will be placed in Good Standing in the B.A. program. Otherwise, they will be Debarred. Students in B.Mus. or B.S.W. failing to meet the specified standard must apply to the Office of Admissions to determine their eligibility for admission to another degree program.

Students in Honours programs who undertake Probation may not go on Probation again. If the CI falls below the cutoff a second time, students will be Debarred unless they can transfer to the B.A. program in Good Standing, with a Declared Major.

Note: The regulations governing progress towards the degree for students transferring from one degree program to another (e.g., B.A. (Honours) to B.A.) will be those in effect at the first registration following the transfer (see 2.4).

Debarred from Further Study

Students in the Honours programs will be Debarred at the time of the Academic Standing evaluation if they do not qualify for transfer to the B.A. program and if any of the following are also true:

(a) their CI would result in Debarment if they transferred to the B.A. program; or

(b) having been placed on Probation in Honours, they fail to achieve Good Standing in Honours at the time of the next Academic Standing evaluation;

or

(c) having cleared Probation in Honours, they subsequently fail to maintain Good Standing; or

(d) they accumulate more than 6.0 unsuccessful attempts; or

(e) when eligible for Second-Year Standing (see 3.4), they are not a Declared Major and fail to qualify for permission to register Undeclared;

or

(f) when eligible for Third- or Fourth-Year Standing (see 3.4), they are not a Declared Major, or having lost standing as a Declared Major, they do not qualify to declare another Major.

5.9 Readmission after Debarment

After a twelve month absence from post-secondary studies, students who have been debarred may petition the Joint Committee on Admissions and Studies for readmission to the University. Each case will be considered individually on its merits and readmission is not guaranteed.

5.10 Accelerated Progress

Students admitted to Qualifying-University year may have some or all of the courses taken in Qualifying-University year count toward the degree if they:

(a) have completed at Carleton one year's full-time study;

(b) have no failures, supplemental or grade-raising examinations (no longer offered) on their record; and

(c) present a GPA of 7.0 or better on 5.0 credits or a total of 35 grade-points.

6.0 Examinations

General regulations on examinations are on p. 48. In addition the following regulations apply to students in the Faculty of Arts and Social Sciences and the Faculty of Public Affairs and Management.

6.1 Supplemental and Grade-Raising Examinations (no longer offered)

The Faculty of Arts and Social Sciences and the Faculty of Public Affairs and Management do not provide supplemental or grade-raising examinations in any courses offered in their departments and other academic units. No student registered in a degree governed by the regulations of these Faculties may write a supplemental or grade-raising examination in any course counting towards the degree.

6.2 Deferred Examinations and Final Papers

Students who are unable to write a final examination or complete a final paper because of illness or other circumstances beyond their control or whose performance on an examination has been impaired by such circumstances may apply within five working days to the Registrarial Services office for permission to write a deferred examination or to extend a term paper deadline. Permission can be granted only if the request is fully and specifically supported by a medical certificate or other documents.

Deferred examinations are not granted to students who make travel plans that conflict with the examination period.

Deferred examinations are normally completed at the times noted in the schedule for the Academic Year (see p. 12). Deferred final papers are due on the following dates:

Fall-term half courses	February 1
Fall-Winter and Winter term courses	June 1
Summer term courses ending in June	August 1
Summer term course ending in August	September 15

Students who have been granted Deferred examinations in one or more Fall/Winter courses may have their Academic Standing delayed until the Summer session is in progress. Grades earned in the Summer Session will not affect Academic Standing evaluations postponed because of Deferral.

6.3 Aegrotat

Application for Aegrotat standing (*Aeg*) must be made to the Registrarial Services office, and will be granted in exceptional circumstances only where no other assessment is considered feasible and only if term work has been of high quality. *Aeg* indicates only a passing standard.

6.4 Review of a Grade

A review of a grade may raise or lower a grade, or leave it unchanged. A review may only be requested when reasonable grounds exist to believe that the grade received is incorrect.

A request for review of term work is made to the instructor assigned to the course and the request can apply to any or all assignments, tests and other evaluations for which grades are available before the last day of classes. The request must be made within 14 days of the return of the graded work and in any case, before the last day of classes.

A review of a final grade is limited to review, by the instructor, of final examinations and final term papers returned after the last day of classes. Students must apply at their Registrarial Services office within the deadlines specified under Academic Year, (p. 12). A fee is charged, refunded if the grade is raised.

6.5 Appeal of a Grade

If the process of Review (see 6.4) has not resolved the concerns or if Review is not appropriate, and where reasonable grounds exist which suggest uncorrected error in the grade assigned by an instructor, then an appeal of a grade may be made to a Chair/Director or to the Dean. An appeal is specific to the grade on a given piece of work, and more than one such grade may be appealed. An appeal must be submitted within 14 days of the return of the graded work. Reconsideration of written work in the course will be assigned by the Chair/Director or Dean to at least one qualified reader other than the instructor.

6.6 Repeated Courses

Students may repeat a course for which they have received a passing grade. The grade awarded on the repetition will be considered to be the final grade whether higher or lower than the original grade. Both grades, however, will be included in the calculation of the CI. Only the last attempt, if successful, will be included in the calculation of the GPA. If the second attempt is unsuccessful, neither attempt will be included in the calculation of the GPA.

7.0 Graduation

7.1 Application to Graduate

Completed applications for graduation must be received in the Registrarial Services office no later than February 1 for Spring graduation, September 1 for Fall graduation, and December 1 for Winter graduation.

See also University Graduation Requirements, p. 48.

7.2 Graduation Requirements, B.A. Degree

Candidates for Graduation must have the following:

- (a) 15.0 credits, not including any credits used to meet Qualifying-University year requirements; and
- (b) an indication that the First-Year Seminar requirement has been met; and
- (c) 3.0 credits which meet the requirement for Breadth, with 1.0 in each of three of the four breadth areas (1.0 of these credits may be in the Major); and
- (d) a CI of at least 4.00; and
- (e) a GPA of 4.0 or better in each Major; and
- (f) a minimum GPA as required by any program option; and
- (g) credits which fulfill the program requirements of the Major(s) and any program options (consult the departmental entries); and
- (h) a minimum of 8.0 credits beyond the 100-level; and
- (i) no more than 8.0 unsuccessful attempts; and
- (j) sufficient Carleton credits to meet the Residence requirements (see 3.11).

7.3 Graduation with Distinction

To qualify for graduation with Distinction, students in the B.A. degree program must:

- (a) have maintained Good Standing throughout their degree studies; and
- (b) present a minimum of 10.0 credits taken at Carleton; and
- (c) normally complete the B.A. degree program within 17.0 attempts; and
- (d) achieve a special average for purposes of Distinction of at least 9.5. This special average will be calculated by dividing the grade-points accumulated over all successfully completed, graded courses presented for the degree by the number of credits obtained from these courses.

Where more than 17.0 attempts appear in the record, the procedure for calculating the special average is modified to include some of the additional attempts, as follows. The grade-points earned in all attempts (successful and unsuccessful) not counting towards the degree are used to place the attempts in order. The grade-points associated with the lowest 2.0 attempts are excluded from the average, while all remaining grade-points and their associated credits are included.

7.4 Graduation Requirements, B.A. (Honours), B.Com., B.Hum., B.I.B., B.J., B.Mus., B.PA., B.PA.P.M. and B.S.W. Degrees

Candidates for Graduation must have the following:

- (a) 20.0 credits not including any credits used to meet Qualifying-University year requirements; and
- (b) for B.A. (Honours) only, an indication that the First Year Seminar requirement has been met; and
- (c) for B.A. (Honours) only: 4.0 credits which meet the requirement for Breadth, with 1.0 in each of three of the four breadth areas, the fourth from any area (1.0 of these credits may be in a Major); and
- (d) the required CI (5.00 or better in B.A. (Honours) and B.Mus., 7.00 or better in the B.PA.P.M. and 6.00 or better in the other degrees); and
- (e) a minimum GPA of 6.5 in each Major; and
- (f) a minimum GPA required by any program option; and

- (g) credits which fulfill the program requirements of the Major(s) and any program options (consult departmental entries); and
- (h) a minimum of 11.0 credits beyond the 100-level, 13.0 in B.Com.; and
- (i) no more than 6.0 unsuccessful attempts; and
- (j) sufficient Carleton credits to meet the Residence requirements (see 3.11).

7.5 Classes of Honours

Graduation averages in Honours

For students graduating in Honours degree programs, the courses which are counted in the overall graduation average will be all those successfully completed courses which are used to meet the degree requirements as published in the calendar which governs a student's progress towards the degree. The Major graduation average will be calculated over successfully completed courses in the Major. For specific details of these procedures, consult the Major department(s).

Three classes of Honours degree are awarded according to the graduation averages attained:

- (a) Highest Honours: 10.0 or better in the Major and 8.0 or better overall.
- (b) High Honours: 9.0 or better in the Major and 7.0 or better overall.
- (c) Honours: 6.5 or better in the Major and 5.0 or better overall.

Departments may recommend the next higher class of Honours degree when a student has one average in the appropriate higher range and the other within 0.2 grade points of the higher range.

To determine the class of Honours degree for students in Honours programs with a Combined Major, the simple average of the two Major averages is used.

7.6 "Mention: français"

Students registered in certain B.A. and B.A. (Honours) programs may earn the notation "Mention: français" by completing part of their requirement in French and by demonstrating a knowledge of the history and culture of French Canada. The general requirements are as follows. For more specific details consult the departmental entries.

Students in a B.A. (Honours) program must present 1.0 credit in French language and 1.0 credit devoted to the history and culture of French Canada. In addition, 1.0 200- or 300-level credit and 1.0 400-level credit in the Honours discipline must be taken in French.

Students in a B.A. program must present 1.0 credit in advanced French and 1.0 credit devoted to the history and culture of French Canada. In addition, 1.0 200- or 300-level credit in the Major discipline must be taken in French.

Students in Combined programs must fulfill the "Mention: français" requirement in both disciplines.

Courses taught in French in the Major may be taken at Carleton, at the University of Ottawa on the Exchange Agreement (see 3.8), or at a francophone university on a Letter of Permission (3.10). Students planning to take courses on exchange or on a Letter of Permission should take careful note of the residence requirement for a minimum number of Carleton courses in their B.A. or B.A.(Honours) programs (3.13).

8.0 The Qualifying-University Year

8.1 Qualifying-University Year

Over the course of the degree, students in Qualifying-University year must present 5.0 credits in addition to the regular degree requirements. 2.0 of the 5.0 credits must include:

- (a) a 100-level course in English;
- (b) Mathematics 69.007★ and 69.017★;
- (c) a language other than English.

Students planning to apply for admission to other programs (i.e., B.J., B.Mus., B.Com.) should ensure that they take appropriate prerequisite courses. All Qualifying-University year students should familiarize themselves with the provisions for Accelerated Progress and ensure that their choice of courses will permit them to proceed into Second-year should they qualify. (see also 5.11)

8.2 Course Selection

Subject to the provisions of 8.1 and placement requirements, Qualifying-University and First-year students can choose 100-level courses from all departments in Arts and Social Sciences, Public Affairs and Management, and Science.

While the University makes every effort to allow students to enroll in courses of their choice, enrolments may have to be limited in certain of the more popular courses.

9.0 First-Year Seminars

The following is a list of all First-Year Seminars, listed alphabetically by academic unit:

Art and Culture

First-Year Seminar 01.101

First-Year Seminar in Art and Culture: Reading Art and Culture

Development of academic writing and study skills through a close analysis of individual works and an examination of theories, aesthetic issues, and critical perspectives found in the literature of music, art history and film studies. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminar three hours a week.

Canadian Studies

First Year Seminar 01.146

First-Year Seminar in Canadian Studies: How Ottawa Works: Exploring National Institutions

This course examines the fundamental political, judicial and administrative institutions which made Canada a unique nation. Students will learn how government institutions are dealing with preservation and maintenance of Canadian cultural and social values. Limited enrolment

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminar three hours a week.

First Year Seminar 01.149

First-Year Seminar in Canadian Studies: Social Change in Canada

Interdisciplinary examination of contemporary movements involved in social change. Assessment of opportunities and constraints for political activism in Canada today. Focus on movements active around the environment, labour, feminism, gay and lesbian rights, racism, poverty and peace. Limited enrolment

Prerequisite: Normally restricted to students entering the First year

of Bachelor of Arts program.
Seminar three hours a week.

Classics

First-Year Seminar 01.116

First-Year Seminar in Classics: Issues in Classical Civilization

An investigation of important issues relating to the Greek and Roman world. Themes will be drawn from literature, history, art, religion and social life. All texts are in English.

Precludes additional credit for Classical Civilization 13.100, 13.102 ★, 13.103 ★.

Prerequisite: Normally restricted to students entering the first year of a B.A. program.

Seminars three hours a week.

Comparative Literary Studies

First-Year Seminar 01.150

First-Year Seminar in Comparative Literary Studies: The Literatures of Europe: Representative Texts

Study of major literary traditions in Europe and their interrelations from antiquity to the present. Authors, such as Homer, Sophocles, Vergil, Dante, Boccaccio, Machiavelli, Cervantes, Molière, Goethe, Flaubert, Austen, Dostoevsky, Proust, Joyce, Pirandello, Kafka, Woolf, Calvino. All texts in English. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminar three hours a week.

Economics

First-Year Seminar 01.103

First-Year Seminar in Economics: Introduction to Economics

Introduction to the major tools and policy problems of economics. Economic analysis is applied to a variety of contemporary problems such as pollution, poverty, the control of monopoly, unemployment, inflation and international economic problems. Limited enrolment.

Precludes additional credit for Economics 43.100.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Lectures three hours a week and one hour discussion group weekly.

English Language and Literature

First-Year Seminar 01.104

First-Year Seminar in English: Survey of English Literature

Historical study of selected authors and works from all periods of British Literature. Communication skills are emphasized. Limited enrolment.

Precludes additional credit for English 18.100

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar 01.105

First-Year Seminar in English: Writing and Language

The essay and essay writing. Communication skills are emphasized. Limited enrolment.

Precludes additional credit for English 18.105.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar 01.106

First-Year Seminar in English: Twentieth-Century Literature

Selected authors and works from twentieth-century literature. Recommended for English majors. Limited enrolment.

Precludes additional credit for English 18.162.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

European and Russian Studies

First-Year Seminar 01.102

First-Year Seminar in European and Russian Studies:

Social Impact of Transformation in the Post Communist Era
Political, economic and social changes that have accompanied the collapse of the Berlin Wall. The role of society in these political upheavals and the impact of the end of the Cold War on reform in Western and developing countries. Limited enrolment. (Also listed as First-Year Seminar in Political Science 01.133.)

Precludes additional credit for Political Science 47.113 ★ and East European Studies 55.113 ★.

Prerequisite: Normally restricted to students entering the First year of a B.A. Program.

Seminars three hours a week.

French

First-Year Seminar 01.147

First-Year Seminar in French: What About Literature?

Study of francophone literature in the larger context of culture and the other arts. This course is given in French. Limited enrolment. Precludes additional credit for First-year Seminar 01.148, French 20.140, 20.241, 20.145, 20.150, 20.151, 20.152, 20.161, 20.162, 20.163.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminar three hours a week.

First-Year Seminar 01.148

First-Year Seminar in French: Thinking About Talking?

Study of the French language and linguistics. This course is given in French. Limited enrolment.

Precludes additional credit for First-Year Seminar 01.147, French 20.140, 20.141, 20.145, 20.150, 20.151, 20.152, 20.160.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminar three hours a week.

Geography

First-Year Seminar 01.109

First-Year Seminar in Geography: Maps and Mapping

An examination of our spatial perspective of the world; the evolution of cartography and mapping. Field mapping techniques, data acquisition and map production principles; the interface with geographic information processing fields. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar 01.110

First-Year Seminar in Geography: It's Your Environment

The causes and consequences of environmental change; emphasis on the interactions of nature and human behaviour. Ways in which the environment can be protected and restored. Environmental issues that affect our own communities. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar 01.111

First-Year Seminar in Geography: Location is Everything

Where we live affects who we are; the role of geographic location and environment on human perception, behaviour, and well-being, viewed at scales ranging from local to global; methods of

collecting and interpreting information about location. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

History

First-Year Seminar 01.112

First-Year Seminar in History: History of Western Civilization

Major events, ideas and movements that have shaped western civilization from the fall of Rome to the twentieth century. Emphasis on the development of writing, research and analytical skills. Limited enrolment.

Precludes additional credit for History 24.101.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Lectures two hours a week, seminar two hours a week.

First-Year Seminar 01.113

First-Year Seminar in History: Introduction to Canadian History

Historical study of the political, economic and social development of Canada with emphasis on the twentieth century. The seminar emphasizes the development of writing, research, and analytical skills. Limited enrolment.

Precludes additional credit for 24.130.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Lectures two hours a week, seminar two hours a week.

First-Year Seminar 01.145

First-Year Seminar in History: Turning Points in Modern History

Seminars emphasizing the development of writing, research, and analytical skills through the intensive examination of selected topics in modern history (e.g., the Italian Renaissance, the French Revolution, the impact of science, industrialization, the origins of the world wars.) Limited enrolment.

Precludes additional credit for History 24.100.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

Interdisciplinary Studies

First-Year Seminar 01.114

First-Year Seminar in Human Rights: Human Rights: Issues and Investigations

Arguments that have been used to defend differing positions on rights issues, past and present. The validity of contending arguments; social factors influencing wide-spread acceptance of particular views. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar 01.115

First-Year Seminar in Interdisciplinary Studies: Reading the Web

Academic writing and study skills through examination of the literacy and social interaction required for various media. Reading and writing on and for the Web and other forms of computer-mediated communications and cooperative work compared with writing for academic purposes. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

Law

First-Year Seminar 01.118

First-Year Seminar in Law: Law and Cyberspace

Law and the challenges posed by new technologies of the information society. Topics include the Internet and freedom of expression, pornography, hate speech, privacy, confidentiality, regulation of communications media, access to information and intellectual property; impact on democracy, national sovereignty, equality, and individual rights. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar 01.119

First-Year Seminar in Law: Law and Literature

Reading literature to explore how law is perceived and understood by society in which it operates; examination of assumptions and concerns about role of law, lawyers, judges and other participants in the legal system through study of fiction dealing with significant legal and moral issues. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar 01.120

First-Year Seminar in Law: Law and Dispute Resolution

Approaches to the legal resolution of disputes in both a theoretical and empirical context. The theory and practice of adjudication and mediation compared. Methodological differences between these processes for resolving disputes; theories of justice which underlie each process. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar 01.121

First-Year Seminar in Law: Governance and the Rule of Law

The historical development and theoretical foundations of the modern concept of the rule of law. The contradictions between theory and legal practice as illustrated in the discretion exercised in the administration of criminal justice and in environmental regulation. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar 01.122

First-Year Seminar in Law: Global Governance and Human Rights

The legal implications of a shift from an emphasis on the sovereignty of the nation-state to governance through international or transnational institutions and non-governmental organizations. The role played by human rights to ensure that this governance will be democratic. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

Linguistics and Applied Language Studies

First-Year Seminar 01.123

First-Year Seminar in Linguistics and Applied Language Studies: Introduction to Academic Language and Culture

Language as it is related to disciplinary enquiry; the language and culture of a variety of disciplines. Intended to enhance students' abilities to understand and acquire the culture, language, and conventions of their own disciplines. Limited enrolment.

Precludes additional credit for Linguistics and Applied Language Studies 29.185 ★.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar 01.124

First-Year Seminar in Linguistics and Applied Language Studies: Language and Social Identity

The creation and expression of social identities through language: gender, age, ethnic and social background. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar 01.125

First-Year Seminar in Linguistics and Applied Language Studies: Language and Power

The role of language in maintaining and contesting power relations in domains such as the media, education, advertising, and politics. How meanings are made and exchanged through language in different situations. Limited enrolment.

Precludes additional credit for Linguistics and Applied Language Studies 29.275 ★.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar 01.126

First-Year Seminar in Linguistics and Applied Language Studies: Intensive Introductory Linguistics

Language as the defining human characteristic. Universal and specific linguistic features in language of adults, children and second-language learners. Limited enrolment.

Precludes additional credit for Linguistics and Applied Language Studies 29.100.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

Mass Communication

First-Year Seminar 01.127

First-Year Seminar in Mass Communication: Introduction to Mass Communication

The emergence of mass communication studies in the 20th century; the major incidents and events which shaped our views of and attitudes towards communication and the media. Limited enrolment

Precludes additional credit for Mass Communication 27.111.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

Philosophy

First-Year Seminar 01.128

First-Year Seminar in Philosophy: Looking at Philosophy

An examination of the following: What is logical thinking? Does God exist? Are values relative? Do we have responsibilities? What is a just society? Do we have free will? What is the mind? What is the nature of reality? Limited enrolment.

Precludes additional credit for Philosophy 32.110.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar 01.129

First-Year Seminar in Philosophy: Contemporary Moral, Social and Religious Issues

Philosophical problems associated with such topical issues as feminism; atheism vs. Theism; the meaning of life; moral relativism vs.

moral objectivism; egoistic vs. non-egoistic ethics; euthanasia and capital punishment; legal paternalism; freedom of the will. Limited enrolment.

Precludes additional credit for Philosophy 32.150.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar 01.130

First-Year Seminar in Philosophy: History of Philosophy

The major figures and developments in philosophy from the early Greeks to the present. A primarily descriptive and comparative approach, though critical reasoning is included for comprehending philosophical developments. Provides a background from which to understand the philosophical aspects of other disciplines. Limited enrolment.

Precludes additional credit for Philosophy 32.160.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

Political Science

First-Year Seminar 01.131

First-Year Seminar in Political Science: Global Political Cultures

The political role of culture in a global context. The integral role of architecture, art, landscape and film in legitimating, popularizing and propagating political endeavours. The imperialism of cultural exchanges between developed and developing countries. Limited enrolment.

Precludes additional credit for Political Science 47.111 ★.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar 01.132

First-Year Seminar in Political Science: North American Politics

A comparative examination of North American political institutions and continental economic integration. Special attention to the political implications of economic integration. Limited enrolment. Precludes additional credit for Political Science 47.112 ★.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar 01.133

First-Year Seminar in Political Science: Social Impact of Transformation in the Post Communist Era

Political, economic and social changes that have accompanied the collapse of the Berlin Wall. The role of the society in these political upheavals and the impact of the end of the Cold War on reform in Western and developing countries. Limited enrolment.

Precludes additional credit for Political Science 47.113 ★, European and Russian Studies 55.113 and First-Year Seminar 01.102.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar 01.134

First-Year Seminar in Political Science: Politics of Race

Meaning, sources and practice of racialism, as well as efforts to combat it, in a comparative context. Case studies include South Africa, the United States, and Canada. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar 01.135

First-Year Seminar in Political Science: Politics of Famine and Disease

Political, economic, social and ecological dimensions of hunger, famine and disease around the world. Limited enrolment.

Precludes additional credit for Political Science 47.115 ★.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

Psychology

First-Year Seminar 01.136

First-Year Seminar in Psychology: Diversity in Psychological World Views

Theories, research, and applications of Psychology from the perspective of different cultures and subcultures. The validity of Psychology across society: how it defines and changes people, and how it reflects and engineers particular social values and norms. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar 01.137

First-Year Seminar in Psychology: Psychology and Criminal Justice

Theories, research, and practical applications of Psychology to the criminal justice system. Topics may include eyewitness testimony, prediction of violence, classification and rehabilitation of offenders, victim studies, and judicial decision making. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar 01.138

First-Year Seminar in Psychology: Motivating Humans

The psychology of human motivation. Everyday concepts such as laziness in relation to diverse theories and explanations of motivation such as drive-reduction, sociobiology, personal goals, self-actualization and spiritual awareness. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar in Psychology 01.139

First-Year Seminar in Psychology: Parents and Parenting Theories, Concepts and Applications from Developmental Psychology

Parents and parenting from infancy to adolescence. Potential topics include: establishing a relationship with your child, child discipline, historical perspectives, child care issues, and the impact of marital conflict and divorce. Applied issues relevant to parents and "future" parents. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar 01.140

First-Year Seminar in Psychology: Cognition: A Scientific Exploration of the Mind

Theories, research, and applications of Cognitive Psychology. Research projects will familiarize students with the scientific method used to study pattern recognition, attention, memory, language and thinking. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

Religion

First-Year Seminar 01.151

First-Year Seminar in Religion: Interpretations of Religion

Modern enquiries into the nature of religion from various perspectives such as anthropology, history, psychology, sociology and theology. Different myths, symbols, scriptures, doctrines, codes and rituals of religious traditions are examined. Limited enrolment.

Precludes additional credit for Religion 34.125, 34.125 ★ or 34.202. Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminar three hours a week.

Social Sciences

First-Year Seminar 01.144

First-Year Seminar in Social Sciences: Introduction to Social Sciences

Introduction to the disciplines comprising the social sciences. Topics include: social sciences and the University, the social scientist in the community, research methods and practice, interdisciplinary approaches to social problems, and information technology in the social sciences. Writing process, problem-solving and critical thinking skills are emphasized. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Lectures two hours a week, workshops two hours a week.

Sociology and Anthropology

First-Year Seminar 01.141

First-Year Seminar in Sociology and Anthropology: Multiculturalism in Canada

Issues relating to the development of and interaction among cultural communities with major emphasis on the realities of "doing multiculturalism in Canada." Research teams; organized seminars with volunteers from Canadian cultural and community groups. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

Women's Studies

First-Year Seminar 01.142

First-Year Seminar in Women's Studies: Issues in Women's Studies

Emphasis on the development of writing, research and analytical skills through the intensive examination of selected topics in women's studies (e.g. Motherhood, sexuality, health, technology, law, politics). Specific themes will vary from year to year. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar 01.143

First-Year Seminar in Women's Studies: Women and the Arts

Feminist research across a range of arts disciplines (including music, theatre, visual arts and film). The importance of feminist debates and theoretical issues in understanding women's involvement in the arts. Topics include gender and sexuality, feminine aesthetics, representation, identity and difference. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

Engineering

Academic Administration

Dean, S.A. Mahmoud
Associate Dean, A.M. Khan
Assistant Dean, R.L. Fleming
Assistant Registrar, P. Clarke

Departmental Chairs:
Civil and Environmental Engineering, J.L. Humar
Electronics, J.S. Wight
Mechanical and Aerospace Engineering, R. Bell
Systems and Computer Engineering, R.A. Goubran

Bachelor of Engineering Degree Program

The Bachelor of Engineering degree is awarded on successful completion of a four-year program of studies with specialization in Aerospace, Civil, Communications, Computer Systems, Electrical, Environmental, Mechanical or Software Engineering, or Engineering Physics. The four-year program comprises common core material emphasizing fundamental mathematical, physical and engineering sciences followed by further study in one of the seven programs. The Environmental Engineering program provides a sound background in environmental engineering and the environmental aspects of chemistry and biology. Several specializations are possible within other Program Options. In Aerospace Engineering, students may select a specialization in Aerodynamics, Propulsion and Vehicle Performance; Aerospace Structures, Systems and Vehicle Design; or Aerospace Electronics and Systems. In Civil Engineering, students may choose either the Program Option or they may choose a Concentration in Management; in Electrical Engineering, students may choose a General Stream or they may specialize in Microelectronics, Systems, or Telecommunications; in Mechanical Engineering, students choose either the Program Option or a Concentration in Computer Integrated Manufacturing.

Licensing, Registration and Accreditation

Licensing and registration are key words for doctors, for lawyers and for engineers. To practice engineering in Canada as a professional (P. Eng.), a person must be registered (licensed) with his or her provincial or territorial professional engineering association.

In 1965, the Canadian Council of Professional Engineers (C.C.P.E.) established the Canadian Engineering Accreditation Board (C.E.A.B.). This board develops standards for engineering degree programs in Canadian universities and monitors the application of these standards to ensure engineering graduates meet the educational requirements of the profession. Graduates from a C.E.A.B.-accredited program meet the educational requirements for registration in any one of the C.C.P.E.'s 12 federated associations. Most Carleton engineering graduates become registered and licensed with Professional Engineers of Ontario (P.E.O.).

The Aerospace, Civil, Computer Systems, Electrical, Environmental and Mechanical Bachelor of Engineering degree programs are accredited by the Canadian Engineering Accreditation Board.

In addition, the new Communications Engineering, Software Engineering and the Engineering Physics programs have been designed for accreditation.

Admission Requirements

Qualifying-University Year

The OSSD. A 75 percent average must be presented on a minimum of 10 Advanced credits at Grades 11 and 12, including an appropriate preparation in Chemistry, Physics and Grade 12 Mathematics.

First Year

The OSSD or the equivalent, including at least six OACs. The six OACs must include the courses Calculus, Algebra and Geometry, Chemistry and Physics with a 70 percent average or better. It is strongly recommended that the remaining OACs include at least one in English or Français.

Possession of the minimum requirement does not guarantee admission. Because of a limit on the number of spaces in the program, preference will be given to applicants with the best academic qualifications. Applicants should be aware that in recent years, the majority of students admitted to the programs offered by the Faculty of Engineering had an average greater than 80 percent.

A student unable to meet the foregoing specific course requirements but otherwise admissible to Carleton University may be admitted, but will be required to satisfy the outstanding requirements at the Qualifying-University year level.

Engineering students are required to make extensive use of computers, and some background in this area prior to admission is a definite asset.

Enrolment Limitation

Applicants should note that in view of limited human and physical resources, meeting the admission requirements can only establish eligibility for selection to the Faculty of Engineering.

Each student offered admission to the Faculty of Engineering will have a place reserved in at least one of the specialized Program Options:

Aerospace, Civil, Communications, Computer Systems, Electrical, Environmental, Mechanical or Software Engineering, or Engineering Physics; this will be confirmed in the letter offering admission. Transfer from one Program Option to another, requested after admission, will be permitted wherever possible. However, the Faculty of Engineering reserves the right to restrict enrolment in each of the foregoing Program Options.

Advanced Standing

Applications for admission with advanced standing to the program leading to the Bachelor of Engineering degree will be evaluated on an individual basis.

Successful applicants will have individual academic subjects, completed with grades of C- or better, evaluated for academic standing, provided the academic work has been completed at another university or degree-granting college or in another degree program at Carleton University.

Mature Applicants

Persons who lack the normal entrance requirements as published in this Calendar but who have been away from full-time studies for a minimum of two years and are 21 years of age or over, by December 31 of the year in which they wish to enroll, may receive consideration for admission to a degree program. See Admissions Section, p. 31 for detailed information.

Instructional Television

Instructional Television offers an alternative mode of access to courses offered at Carleton University. Your learning experience at Carleton University may include a mix of on-campus and television courses. For detailed information about **itv** refer to p. 57.

English Proficiency Requirements

English Placement Test

The University policy governing applicants whose mother tongue is a language other than English is given on p. 31.

Industrial Experience Program

Students with a cumulative GPA of 7.0 or better may apply to the Industrial Experience Program. Subject to the availability of positions, suitable students may be placed in industry or government, for a period of 12 to 16 months beginning in May following the Third year of the program. Applications must be made in writing to the relevant Departmental Chair before October 1 of Third year.

Students participating in the "Industrial Experience Program", Engineering 91.400, will be required to submit a formal report when entering Fourth year. Engineering 91.400 carries no weight and no course credit.

Co-operative Education Options

Co-operative education options are available in all engineering programs. Details are given below. General Information on Co-op programs can be found on p. 39.

Aerospace, Civil, Environmental, and Mechanical Engineering Co-operative Industrial Experience Option

Students in the Bachelor of Engineering (B.Eng.) program in the Departments of Civil and Environmental Engineering and Mechanical and Aerospace Engineering have the opportunity to enroll in a Co-operative Industrial Experience option (co-op option). Students admitted to this option must satisfy the normal requirements for graduation in the B.Eng. program, and, in addition, the graduation requirements specific to the co-op option. See p. 87.

Students wishing to have a co-op option designation on their transcript must successfully complete in a minimum of four work terms with each work term having a duration of four months. The program structure is summarized in the following table:

Calendar Year	Fall	Winter	Summer
1	Study Term 1	Study Term 2	Work Term 1
2	Study Term 3	Study Term 4	Work Term 2
3	Study Term 5	Study Term 6	Work Term 3
4	Work Term 4	Work Term 5	Work Term 6
5	Study Term 7	Study Term 8	

This format allows flexibility as to when students may start and complete their co-op program. Students may choose any combination of the work terms as long as the total number of work terms is four. Precise start and completion dates are established in consultation with the employer.

Admission Requirements and Registration Information

Students satisfying the following conditions will be considered admissible to the co-op option:

- a) an 80% average or better in core math and science courses from a Canadian high school;
- b) be registered as a full-time student;
- c) be eligible for work in Canada;

Students may also apply to the co-op option once they have arrived at the University at any time until the end of their sixth term of study, provided they have a cumulative GPA of 7.0 or better.

Students must maintain a cumulative GPA of 7.0 or better in order to continue in the co-op option.

Note that meeting the above entrance requirements only establishes eligibility for admission to the program. Enrollment in the co-op option may be limited at the discretion of the department.

Voluntary Withdrawal from the Co-op Option

Students may voluntarily withdraw from the co-op option prior to placement without penalty. Such students are eligible to continue in the regular B.Eng. program provided they meet the academic standards required for continuation in the program. Once students are placed in a work term they may only withdraw from the option with mutual assent of the employer and the Co-op Program Administrator.

Continuation in the Co-op Option

Once admitted to the co-op option, students must:

- a) maintain full-time status in each study term;
- b) meet the academic standards required to continue in the co-op option;
- c) obtain a Sat grade in all work-term courses;
- d) accept positions which they have been awarded;
- e) attend all pre-arranged interviews with employers;
- f) pay the work-term placement fee within three months of starting each work-term.
- g) maintain legal eligibility to work in Canada.

Students who fail to meet any of these requirements will be required to withdraw from the co-op option.

Students who are required to withdraw from the co-op option will be eligible to continue in their regular B.Eng. program provided they meet the minimum standards required for continuation in the program.

Degree Designation

Students successfully completing the requirements for graduation from the co-op option will receive a "B.Eng. (Co-operative Industrial Experience Option)" degree designation.

Although every effort is made to find a sufficient number of placements for all students admitted to the co-op option, no guarantee of employment can be made. The employment process is competitive, and academic performance, skills, motivation, maturity, attitude and potential will determine whether a student is offered a job.

Employment

Although every effort is made to find a sufficient number of placements for all students admitted to the co-op option, no guarantee of employment can be made. The employment process is competitive, and academic performance, skills, motivation, maturity, attitude and potential will determine whether a student is offered a job.

Communications Engineering, Computer Systems Engineering, Electrical Engineering, Engineering Physics, and Software Engineering Co-operative Education Options

Students admitted to the Communications Engineering, Computer Systems Engineering, Electrical Engineering, Engineering Physics, and Software Engineering programs may be eligible to register in the Co-operative Education Option. The option combines academic study with relevant work term experience. Students enrolled in this option must complete the normal requirements for graduation, and, in addition, must successfully complete a minimum of four work terms. In addition to meeting the admission requirements, students participating in the option must be full-time students who are legally eligible to work in Canada.

The structure of study and work terms for Computer Systems Engineering, Electrical Engineering, Engineering Physics, and Software Engineering is shown in the table below. The shaded terms are work terms. In Computer Systems Engineering and Electrical Engineering, a regular fall-winter pattern of study terms is available for students who are not enrolled in the co-op option. In Software

Engineering, the pattern of study terms shown below is the only one available, even for those students who are not enrolled in the co-op option. Engineering Physics is a co-op only program, so the pattern of work and study terms shown below is the only one available.

Calendar Year	Fall	Winter	Summer
1	Study Term 1	Study Term 2	Work Term 1
2	Study Term 3	Study Term 4	Work Term 2
3	Study Term 3	Study Term 5	Work Term 6
4	Work Term 4	Work Term 5	Work Term 6
5	Study Term 7	Study Term 8	

All study terms are identical in the co-op and regular options of Computer Systems Engineering and Electrical Engineering, except for study terms 5 and 6. The third year study terms for these two programs are given below.

**Computer Systems Engineering (Co-op Option)
Third Year (study terms 5 and 6)**

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Winter	Summer	Winter	Summer	
69.352 ★ Probability and Statistics	-	4	-	-	5
91.380 ★ Engineering Economics	3	-	-	-	4
94.301 ★ Operating Systems and Data Bases	3	-	-	-	4
94.310 ★ Systems Analysis	-	3	-	-	4
94.333 ★ Real-Time Concurrent Systems	-	2	-	3	5
94.351 ★ Communication Theory	-	3	-	3/2	5
94.360 ★ Systems and Simulation	3	-	3	-	6
94.361 ★ Microprocessor Systems	-	3	-	3/2	5
94/97.395 ★ Professional Practice	3	-	-	-	4
97.350 ★ Digital Electronics	3	-	3	-	6
	15	15	6	6	48

**Electrical Engineering (Co-op Option)
Third Year (study terms 5 and 6)**

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Winter	Summer	Winter	Summer	
69.352 ★ Probability and Statistics	-	4	-	-	5
94.306 ★ Computer Organization	-	3	-	2	5
94.351 ★ Communication Theory	-	3	-	3/2	5
94.360 ★ Systems and Simulation	3	-	3	-	6
94/97.395 ★ Professional Practice	3	-	-	-	4
97.315 ★ Basic EM and Power	3	-	3/2	-	5
97.350 ★ Digital Electronics	3	-	3	-	6
97.359 ★ Electronics II	-	3	-	3	6
97.398 ★ Physical Electronics	3	-	3/2	-	5
97.399 ★ Electromagnetic Waves	-	3	-	3/2	5
	15	16	9	8	52

The structure of study and work terms for Communications Engineering is shown in the table below. The shaded terms are work terms.

Calendar Year	Fall	Winter	Summer
1	Study Term 1	Study Term 2	Work Term 1
2	Study Term 3	Study Term 4	Work Term 2
3	Study Term 5	Study Term 6	Work Term 3
4	Work Term 4	Work Term 5	Work Term 6
5	Study Term 7	Study Term 8	

Admission to the Co-op Option

Because Engineering Physics is co-op only, only Direct Admission from High School is available, however the other co-op programs offer three opportunities for admission, as outlined below. These opportunities are open only to students who are legally eligible to accept employment in Canada. All applications are considered on a case-by-case basis, particularly applications from students who have completed high school in a foreign system, or where advanced standing has been granted for courses completed at other institutions.

(i) Direct Admission from High School

Students with an excellent average in the core mathematics and science courses in high school may be offered admission directly from high school. For Electrical Engineering and Engineering Physics, the minimum average in the core mathematics and science courses is 85% or better from a Canadian high school system. Minimum admission standards for the other programs are similar.

(ii) Admission after Study Term 1

To be eligible for admission after Study Term 1, students must apply no later than the first day of Study Term 2, and must have:

- a) completed all required First year courses;
- b) obtained a GPA of 10.0 or better in the Study Term 1, and;
- c) obtained the permission of the Co-op Faculty Advisor.

All students who wish to apply for jobs in the first work term, including those already admitted to the co-op option, must meet these eligibility criteria.

(iii) Admission After Study Term 3

To be eligible for admission to the co-op option after Study Term 3, a student must apply no later than the last day for late registration in study term 3, and must have:

- a) maintained a GPA of 8.0 or better in all study terms;
- b) successfully completed all required First year courses, and;
- c) successfully completed all required 94.2xx and all 97.2xx courses, of which at least 2.0 credits were completed at Carleton.
- d) obtained the permission of the Co-op Faculty Advisor.

Continuation in the Option

Once admitted to the co-op option, a student must:

- a) maintain full-time status and a GPA of 8.0 or better in each study term;
- b) complete all courses required in each study term with a GPA of 8.0 or better;
- c) obtain a *Sat* grade in all work term courses;
- d) successfully complete all required courses in Study Terms 1, 2, 3, and 4 before starting Work Term 2;

e) successfully complete all required courses in Study Terms 1, 2, 3, 4, 5, and 6 before starting Work Term 4 (Work Term 3 for Communications Engineering).

f) maintain legal eligibility to work in Canada.

Students who fail to meet these requirements will be required to withdraw from the co-op option.

Students who withdraw from the co-op option will be eligible to continue in the corresponding regular B.Eng. program provided they meet the minimum academic requirements for the Faculty of Engineering. (See p. 85).

Graduation Requirements

Students who successfully complete at least four co-op work term courses in addition to the requirements of the regular program will be eligible for graduation from the Co-operative Education Option. A Co-operative Education Option designation will appear on the final transcript and diploma.

Work Term Placements

All job placements are subject to demand by industry. The Co-op Office will make available a list of job postings, and will schedule the interviews. It is the final responsibility of the student to secure an available position through successful participation in the competitive interview process. Remuneration for work term positions is a matter for negotiation between the student and the employer.

Students may make their own work term placements subject to the prior approval of the Co-op Faculty Advisor. The planned work must have relevant engineering content. Students without placements for Work Term 1 may choose to delay their first placement until Work Term 2. Computer Systems Engineering students without placements in Work Term 2 may wish to return to the regular program for Third year and apply for the Industrial Experience Program (16 month internship placement) between Third and Fourth years.

Engineering Common First Year

First year	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
Term	Fall	Winter	Fall	Winter	
65.111 ★ Chemistry for Engineering Students	-	3	-	3	6
69.104 ★ Calculus for Engineering Students	3	-	1	-	5
69.105 ★ Differential Equations and Infinite Series	-	3	-	1	5
69.114 ★ Linear Algebra for Engineering Students	-	3	-	1	5
75.104 ★ Introductory Physics for Engineering Students	-	3	-	3	6
91.100 ★ Orientation to Engineering	2	-	4	-	5
91.111 ★ Mechanics I	3	-	3	-	6
91.166 ★ Problem Solving and Computers	3	-	1	-	5
Elective ★ Arts or Social Sciences	3	-	-	-	4
Elective ★ Arts or Social Sciences	-	3	-	-	4
	14	16	9	10	51

Note (a) Students in Aerospace Stream C, Civil, Environmental and Computer Systems will take 23.100 ★ in First Year.

Qualifying-University Year

Students who have not yet completed six OACs (including Calculus, Algebra and Geometry, Physics and Chemistry) or equivalent may apply to Qualifying-University year. The formal admission requirements are listed on p. 41, although alternative background preparations (e.g. courses from other Provinces, mature applicant status, etc.) may be presented for evaluation.

The course of studies consists of 5.0 full credits including mathematics, physics, chemistry and electives. The exact course of stud-

ies depends on background preparation and is to be determined in consultation with the Faculty Registrarial Services office at the time of registration.

Accelerated Progress

Qualifying-University year (Engineering) students who pass all required courses in Qualifying-University year, including electives, with a B- or 7.0 average or better, may have their programs assessed

for the purpose of reducing the number of courses required to graduate from the Bachelor of Engineering program. For example, approved humanities/social sciences electives taken as Qualifying-University year electives, which are at a First-year level or higher, may be used to fulfill program requirements in the Bachelor of Engineering program. It is necessary for Qualifying-University year students to meet the promotion requirements of the Qualifying-University year, as well as the Accelerated Progress requirements, in order to be considered for Accelerated Progress.

Academic Standing and Promotion

Students in Qualifying-University year are permitted to enroll in Summer-session courses, in a maximum of 2.0 credits or equivalent.

General Information

The study of Engineering is necessarily structured. Upper-year courses are built on the material studied in previous years. The program consists of a consecutive sequence of four years, each of which comprises the two terms of the Fall/Winter session. Regulations governing promotion are detailed below.

With few exceptions, courses in the Faculty of Engineering are offered only in the Fall/Winter session and only in the Day division. However, a significant portion of the Engineering program involves courses in the Faculties of Science, Arts and Social Sciences; many of these courses are offered in the Summer session and in the Evening division of the Fall/Winter session.

It should be noted that in all courses with computer programming assignments students usually find it necessary to be on campus at other than scheduled periods to make use of computing facilities.

For administrative matters regarding regulations and records, students are encouraged to seek advice from the Faculty Registrarial Services office.

Course Load

The course requirements for each year of the program are tabulated beginning on p. 87 along with the course weight and hours for each course.

Where the fraction $3/2$ appears in the laboratory and problem analysis column, it means a three-hour period is scheduled on alternate weeks; the fraction $1/2$ refers to a one hour workshop on alternate weeks.

During the Fall/Winter session, the normal course load for a full-time student is all of the courses for the program year in which the student is registered. The normal course load for Fourth-year students is the lesser of the courses of the program year or the number of courses required to satisfy graduation requirements. In order to enroll in a course, a student must have satisfied the prerequisites for that course or have permission of the department offering the course. Any student who is enrolled in a course but who has not satisfied the prerequisites for that course is required to obtain approval or may be required to withdraw from the course.

During the Summer session, the maximum course load is 2.0 credits.

Elective Courses

The program course requirements tabulated beginning on p. 92 include arts or social sciences electives. Electives are selected from one or more of the categories listed below. Where an elective course is shown in the tables with lectures two hours a week and laboratory/problem analysis three hours alternate weeks, the requirement is equally satisfied by a course having three hour lectures a week and no laboratory/problem analysis.

1. *Engineering Electives*: Unless otherwise stated, all undergraduate courses bearing the departmental numbers of the Faculty of Engi-

To achieve satisfactory academic standing the student must, at the end of August:

- (a) have received credit in Chemistry, Mathematics and Physics.
- (b) have a GPA of 3.4 or better in all courses completed in the year.

Students who achieve satisfactory academic standing are promoted to First-year Engineering. Students who fail to achieve satisfactory academic standing forfeit their undergraduate status in the Faculty of Engineering.

The Qualifying-University year is not considered as part of the Bachelor of Engineering program for the purpose of assessment of academic standing in the program.

neering (i.e. 81, 82, 86, 87, 88, 94, 97) are approved Engineering electives. Graduate courses bearing those numbers may be taken as electives with the approval of the chair of the department offering the course.

2. *Arts or Social Sciences Electives*: Courses in this classification must be chosen from among those listed as approved in the booklet, Engineering Program Guide, available from the Faculty Registrarial Services office.

Student Responsibility

The student is responsible for knowing the regulations of the Faculty of Engineering and for complying with them. Any exceptions to the regulations must be approved, in writing, by the Faculty of Engineering Committee on Admission and Studies.

Grading System

Standing in courses will be shown by alphabetical grades. (See p. 47).

Each course is assigned a course weight, shown on the charts beginning on p. 88. The weighted grade points achieved in a course are the product of the course weight and the grade points for that course. The cumulative weighted GPA is the sum of weighted grade points divided by the sum of course weights, for all courses for which the student has received a grade in the program of studies.

Where regulations refer to 1.0 credit, it is understood that two 0.5 credits are in all respects equivalent to 1.0 credit. Any course in the Engineering program with a weight of seven or greater is 1.0 credit; any course with a weight of six or less is a 0.5 credit.

Notations to represent special circumstances are as follows:

Aeg

Aegrotat standing is a pass standing granted despite absence from the final examinations. It may be granted by the Engineering Faculty Committee on Admission and Studies only in response to a student's written request. Aegrotat standing will be granted only in exceptional circumstances and if the term work has been of high quality.

F

Failure; no academic credit.

FWS

Failure, but with supplemental privileges. No academic credit. This grade can only be given to Engineering courses at the 400-level.

Wdn

Withdrawn in good standing; no academic credit.

Abs

Absent from final and supplemental examinations. No supplemental privileges. No academic credit.

Def

Indicates deferral of final grade has been approved by the Engineering Committee on Admission and Studies (see deferred Final Examinations p. 48).

Sat

Satisfactory.

Uns

Unsatisfactory.

Grade-Raising Examinations

The Faculty of Engineering does not recognize grade-raising examinations. Students enrolled in the Bachelor of Engineering degree program may not take grade-raising examinations in any course that forms part of their program.

Supplemental Examinations

In the Faculty of Engineering, supplemental examinations are offered only in Engineering courses at the 400-level. Supplemental examinations in Fall and Winter term courses at the 400-level are scheduled by the Registrarial Services office for the Faculty of Engineering.

A pass in a supplemental examination is given a grade of D-, which has a grade point value of 1. A failure in a supplemental examination retains the F grade.

Summer Session

Students are permitted to enrol in a maximum of 2.0 credits in the Summer session.

All Engineering, Mathematics and Science courses taken in the Summer session may be used to complete program requirements. Such courses count towards both continuation and program completion, and are reflected in the year's credit count, the year's weighted GPA, and in the cumulative weighted GPA.

The maximum number of Arts or Social Sciences electives that can be counted towards continuation is 1.0 credit in an academic year. Excess Arts or Social Sciences electives, taken during a Summer session or the previous Fall/Winter session, may be used to fulfill future program requirements. These courses will not affect the continuation decision for either the current year or for any future year but will count towards degree program completion, and will be reflected only in the cumulative weighted GPA.

Academic Standing and Continuation

Academic standing for the academic year is determined, for all students, at the beginning of September. Standing is based on grades achieved during the previous 12-month period. This includes all earned grades for the Fall/Winter session, supplemental examination results in Fall/Winter session courses, and results in Summer session courses.

A year of study, as used in the Faculty of Engineering, refers to the academic year from September 1 to August 31 of the following year, and not to the program year defined in the previous section of these regulations. A year's weighted GPA is based on all courses (including a maximum of 1.0 credit of Arts or Social Sciences elective) taken during one academic year; calculation of the cumulative weighted GPA is based on the courses from all academic years in which the student has been registered in the B.Eng. program. The most recent grade obtained in each course will be used to compute the cumulative weighted GPA. Courses that were previously completed and credited towards a previous year's GPA cannot be retaken to raise a current year's GPA.

Satisfactory Academic Standing

In order to meet the minimum requirements for satisfactory academic standing all students must:

1. meet the weighted GPA for the year of study just completed as listed below;
2. meet the cumulative weighted GPA for all courses taken as part of the B.Eng. program as listed below:

	Year's GPA	Cumulative GPA
after one year of study	3.0	3.0
after two years of study	3.2	3.2
after three or more years of study	3.4	3.4

3. not receive a grade of *F* or *Abs* in the year of study just completed in excess of the allowable number listed below:

Number of Credits Taken	Maximum Number of Credits Graded <i>F</i> or <i>Abs</i>
0.5 - 1.0	0
1.5 - 2.5	0.5
3.0 - 4.0	1.0
4.5 - 5.5	1.5
6.0 or more	2.0

Continuation

Students who achieve satisfactory academic standing may continue in their program.

Failure

Students who fail to achieve satisfactory academic standing fail the current year of study.

Academic Probation

Students who have failed their year of study and have never been on academic probation may continue on academic probation.

Students who are placed on academic probation must repeat courses in which grades lower than C- were received in the failed year.

In order to clear probation, a student must obtain a year's weighted GPA of 4.0 or better in a minimum of 3.0 credits and must not receive a grade of *F* or *Abs* in the year of study just completed in excess of the allowable number listed below:

Number of Credits Taken	Maximum Number of Full Credits Graded <i>F</i> or <i>Abs</i>
3.0 - 4.5	0.5
5.0 or more	1.0

Ineligibility to Return

Students who fail an academic year on a second occasion are ineligible to return to the Faculty of Engineering.

Students who fail to clear probation are ineligible to return to the Faculty of Engineering.

Graduation

In order to fulfill the minimum graduation requirements for the degree of Bachelor of Engineering, a candidate must:

1. have completed the requirements of the First through Fourth years, inclusive, with a cumulative GPA of 3.4 or better.
2. have achieved satisfactory academic standing in the final year of study.

3. be recommended for graduation by the Faculty of Engineering. Students must also fulfill all University graduation requirements. (See p. 48.)

Degrees with Distinction

Upon recommendation of the Faculty of Engineering, the notation "with High Distinction" may be made on the academic record of a candidate for the degree of Bachelor of Engineering. To be considered for recommendation, the candidate is expected to obtain a weighted GPA of at least 10.0 in the course requirements of the Fourth year of that student's Program Option; in addition, the student must present a weighted GPA of at least 8.0 in the course requirements of the First to Fourth years, inclusive. Any candidate with a failure, supplemental examination, repetition or replacement course will not normally be considered for a degree "with High Distinction."

Upon recommendation of the Faculty of Engineering, the notation "with Distinction" may be made on the academic record of a candidate for the degree of Bachelor of Engineering. To be considered for this recommendation, the candidate is expected to obtain a weighted GPA of 9.0 or better in the course requirements of the Fourth year of that student's Program Option; in addition, the student must present a weighted GPA of 7.0 or better in the course requirements of the First to Fourth years, inclusive. Any candidate with a failure, supplemental examination, repetition or replacement course in more than a total of 2.0 credits will not normally be considered for a degree "with Distinction."

Note: In addition to these numerical requirements, students must also fulfill the detailed requirements listed under the "Graduation" section, see above.

Graduate Programs

Programs of study are offered by the Faculty of Engineering leading to the degrees of Master of Engineering and Doctor of Philosophy in Aerospace, Civil, Electrical and Mechanical Engineering; to the degree of Master of Engineering in Materials Engineering, to the degree of Master of Engineering in Telecommunications Technology Management; and, in co-operation with the Faculty of Science, to the degree of Master of Science in Information and Systems Science. In co-operation with the School of Computer Science, the School of Mathematics and Statistics, and the University of Ottawa, the Faculty offers a joint program leading to the degree of Master of Computer Science. Joint programs in Aerospace, Civil, Electrical and Mechanical Engineering at both Masters and Ph.D. levels are offered in conjunction with the University of Ottawa. For further details, contact the Graduate Secretary, Faculty of Engineering, or refer to the Faculty of Graduate Studies and Research Calendar.

Academic and Professional Clubs and Societies

The following clubs and societies operating on the campus serve to broaden and enrich the curriculum and to offer students social activity and friendship related to their intellectual interests. The societies listed here are particularly pertinent for students registered in the Faculty of Engineering.

The Canadian Society for Mechanical Engineering - Student Section sponsors field trips, films and speakers on industrial and other aspects of mechanical engineering.

The American Society for Materials for students interested in Materials Engineering; students are invited to the monthly meetings of the Ottawa Valley chapter of ASM. Faculty Adviser, Dr. M. J. Bibby.

The Canadian Aeronautics and Space Institute meets monthly to provide a forum for discussion and dissemination of information on topics relating to aeronautics and space activities.

The Canadian Society for Civil Engineering promotes technical activities related to all areas of civil engineering, such as building design and construction, geotechnical engineering and transportation. The activities of this group are designed to enhance and broaden the student's appreciation of the profession. To this effect, speakers are brought to the Department of Civil Engineering to give seminars on current topics and visits are organized to construction sites and other facilities where civil engineering has played an important role. Faculty Adviser: Dr. S.J. Kennedy.

The Carleton Student Engineering Society (C.S.E.S.) is open to all members of the University who are enrolled in Engineering courses. Through its academic and social activities, C.S.E.S. acts as a liaison between the students and the governing bodies of the University and promotes professional interest, high standards and a spirit of mutual assistance in the study of engineering.

The Institute of Transportation Engineers (I.T.E.) is an international organization of professional transportation engineers. The I.T.E. is organized into Districts, of which Canada is one, and into Sections, of which Ottawa is one. For students in transportation, there are Student Chapters, one of which is located on campus. The Chapter is closely associated with the local Section. Joint meetings are held once a month in Ottawa. The meetings have both a technical and social content. Membership in the Student Chapter is an excellent way of becoming part of the profession of transportation engineering. Students enrolled in the transportation program are eligible to join. Faculty Adviser: Dr. John P. Braaksma.

The Student Branch of the Institute of Electrical and Electronics Engineers (I.E.E.E.) organizes a series of events of both professional and general interest. Among these activities are an annual "Computer Fair", an employment workshop for upper-year students, an annual "papers" night and student-faculty get-togethers. Faculty Adviser: Dr. Calvin Plett.

Common Core Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Engineering 91.100 ★

Orientation to Engineering

Introduces the engineering profession; major disciplines, regulation and contemporary issues in engineering; importance of writing in engineering. Drawing instruments and elementary drawing techniques such as pictorial sketching and orthographic projection; section views; CAD systems, introduction to the fundamentals of manufacturing methods.

Lectures and tutorials two hours a week, laboratories four hours a week.

Engineering 91.111 ★

Mechanics I

Introduction to mechanics. Scalars and vectors. Concurrent forces: resultant and components. Statics of particles. Moments and couples. Force system resultants. Rigid body equilibrium. Frames and machines. Internal forces. Kinematics and kinetics of particles. Conservation theorems: work-energy; impulse-momentum. Centroids and centres of gravity.

Lectures three hours a week, tutorials and problem analysis three hours a week.

Engineering 91.166 ★

Problem Solving and Computers

Introduction to engineering problem solving. Defining and modeling problems, designing algorithmic solutions, converting algorithms to C++ programs, testing, debugging. Program style, documentation, reliability. Numeric methods: representation of data, rounding and truncation errors, root finding, curve fitting.

Precludes additional credit for Engineering 94.110 ★ and 94.112 ★. Lectures three hours a week, laboratory one hour a week.

Engineering 91.266 ★

Numerical Methods

Numerical algorithms and tools for engineering and problem solving. Sources of error and error propagation, solution of systems of linear equations, curve fitting, polynomial interpolation and splines, numerical differentiation and integration, root finding, solution of differential equations. Software tools.

Precludes additional credit for Engineering 94.266 ★.

Prerequisites: Mathematics 69.105 ★ and Engineering 91.166 ★.

Lectures three hours a week, laboratory one hour a week.

Engineering 91.380 ★

Engineering Economics

Introduction to engineering economics; cash flow calculations; methods of comparison of alternatives; structural analysis; replacement analysis; public projects; depreciation and income tax; effects of inflation; sensitivity analysis; break-even analysis; decision making under risk and uncertainty.

Prerequisite: Third-year registration.

Lectures three hours a week.

Engineering 91.400

Industrial Experience Report

Students participating in the Industrial Experience Program must submit a formal report upon returning. This report should describe the organization in which the internship took place, the role of the student, the experience obtained and an appraisal of the effectiveness of the training received. Engineering 91.400 is a course with a 0.0 credit value and carries no weight. Grades for the course are SAT (satisfactory) or UNS (unsatisfactory). This course is extra to the degree requirements.

Aerospace Engineering Program

Aerospace Engineering covers a wide variety of applications ranging from aircraft aerodynamics, structures and propulsion to the complete design and systems integration of air and space vehicles. The main disciplines relating to airframes, propulsion and space platforms are solid mechanics and materials, fluid mechanics and thermo-sciences; the topic areas are basically the same as for Mechanical Engineering, with a somewhat different emphasis. Electronic systems are a vital, sometimes dominant, element in modern aircraft and spacecraft for navigation, guidance and control. In addition, electronic systems for remote sensing, communication, etc., normally comprise the entire payload of a spacecraft. Electronics and Systems engineering are key disciplines in such situations, dynamics and the thermo-sciences are important in designing the systems for the environment in which they must function.

Three streams are available in the Aerospace Engineering degree program (A) Aerodynamics, Propulsion and Vehicle Performance; (B) Aerospace Structures, Systems and Vehicle Design; (C) Aerospace Electronics and Systems. The (A) and (B) streams are identical to the Mechanical program for the first two years while the (C) stream differs only slightly in Second year.

The Third year of all streams differs substantially from the Mechanical Engineering program while the Fourth year is almost entirely different. Stream (C) incorporates numerous electronics and systems engineering courses. All aerospace engineering students

Work Term Report Courses

Co-op students must be registered as full-time students in the Bachelor of Engineering program in all academic terms of the co-op option. While on work terms students must be registered in one of the following report courses:

Aerospace, Civil, Environmental and Mechanical Engineering

81/82/86.191 ★ **Work Term 1**

81/82/86.292 ★ **Work Term 2**

81/82/86.393 ★ **Work Term 3**

81/82/86.394 ★ **Work Term 4**

81/82/86.395 ★ **Work Term 5**

81/82/86.396 ★ **Work Term 6**

Communications, Computer Systems and Electrical Engineering, Engineering Physics and Software Engineering

94/97.191 ★ **Work Term 1**

94/97.291 ★ **Work Term 2**

94/97.292 ★ **Work Term 3**

94/97.391 ★ **Work Term 4**

94/97.392 ★ **Work Term 5**

94/97.393 ★ **Work Term 6**

At the completion of each work term, a report on activities undertaken must be submitted to the Co-op Faculty Advisor. The employer will submit an evaluation of the student's performance during the work term. A work term course grade of Sat or Uns will be assigned by the Co-op Faculty Advisor on the basis of the work term report and the employer's evaluation.

will participate as design team members in a single major project, typically involving the design of an aerospace vehicle in an environment much like that of an engineering design office.

Co-operative Industrial Experience Program Option

The Department of Mechanical and Aerospace Engineering offers a Co-operative Industrial Experience Program Option for eligible students. Upon satisfactory completion of the option, students will receive the designation B. Eng. (Co-operative Industrial Experience Option) on their transcripts. For details, refer to Co-operative Education Section on p. 39.

Suggested Engineering Electives

Any course numbered Engineering 86/87/88.4xx for which the prerequisite material and other noted constraints are satisfied. Stream C may also use courses numbered 94/97.4xx.

Spacecraft Design

Aspects of spacecraft design are covered in both the Aerospace Program (Streams A, B and C), and also in the Mechanical Program; therefore, both Aerospace and Mechanical students may follow their interests and accommodate this area of study.

Aerospace students can achieve this by choosing appropriate electives such as 87.481 ★, 88.451 ★, 88.453 ★, and the Aerospace Project, 87.497.

Engineering

Aerospace Stream A - Aerodynamics, Propulsion and Vehicle Performance

Aerospace Stream B - Aerospace Structures, Systems and Vehicle Design

Second Year

		Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
Term		Fall	Winter	Fall	Winter	
69.204★	Multivariable Calculus for Engineering Students	4	-	-	-	5
69.375★	Mathematical Methods I	-	4	-	-	5
86.201★	Engineering Graphics and Design	-	2	-	4	5
86.211★	Engineering Dynamics	3	-	3	-	6
86.222★	Mechanics of Solids I	3	-	3	-	6
86.230★	Fluid Mechanics I	-	3	-	3	6
86.240★	Thermodynamics and Heat Transfer	3	-	3	-	6
86.270★	Introduction to Engineering Materials	-	3	-	3	6
91.266★	Numerical Methods	-	3	-	1	4
23.100★	Communication Skills for Engineering Students	-	-	3	-	4
		13	15	12	11	51

Aerospace Stream C - Aerospace Electronics and Systems

Second Year

		Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
Term		Fall	Winter	Fall	Winter	
69.204★	Multivariable Calculus for Engineering Students	4	-	-	-	5
69.375★	Mathematical Methods I	-	4	-	-	5
86.211★	Engineering Dynamics	3	-	3	-	6
86.222★	Mechanics of Solids I	3	-	3	-	6
86.230★	Fluid Mechanics I	-	3	-	3	6
97.251★	Circuits and Signals	3	-	3	-	6
91.266★	Numerical Methods	-	3	-	1	4
94.202★	Program Design and Construction	3	-	2	-	5
97.267★	Switching Circuits	-	3	-	3/2	5
97.257★	Electronics I	-	3	-	3	6
		16	16	11	8.5	54

Aerospace Stream A - Aerodynamics, Propulsion and Vehicle Performance

Third Year

		Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
Term		Fall	Winter	Fall	Winter	
69.352★	Probability and Statistics	-	4	-	-	5
86.304★	Dynamics of Machinery	3	-	1	-	5
86.322★	Mechanics of Solids II	3	-	3	-	6
86.330★	Fluid Mechanics II	3	-	3	-	6
86.340★	Applied Thermodynamics	-	3	-	1	5
86.491★	Mechanical and Aerospace Engineering Lab	-	1	-	5	5
87.302★	Aerospace Design and Practice	-	3	-	3	6
87.370★	Aerospace Materials & Manufacturing Methods	-	3	-	1	5
94.360★	Systems and Simulation	3	-	3	-	6
97.365★	Electrical Engineering	3	-	3/2	-	5
		15	14	11.5	10	54

Aerospace Stream B - Aerospace Structures, Systems and Vehicle Design**Third Year**

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
69.352 ★ Probability and Statistics	-	4	-	-	5
86.304 ★ Dynamics of Machinery	3	-	1	-	5
86.322 ★ Mechanics of Solids II	3	-	3	-	6
86.330 ★ Fluid Mechanics II	3	-	3	-	6
86.491 Mechanical and Aerospace Engineering Lab	-	1	-	5	5
87.302 Aerospace Design and Practice	-	3	-	3	6
87.311 Lightweight Structures	-	3	-	1	5
87.370 ★ Aerospace Materials & Manufacturing Methods	-	3	-	1	5
94.360 ★ Systems and Simulation	3	-	3	-	6
97.365 ★ Electrical Engineering	3	-	3/2	-	5
	15	14	11.5	10	54

Aerospace Stream C - Aerospace Electronics and Systems**Third Year**

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
69.352 ★ Probability and Statistics	-	4	-	-	5
86.240 ★ Thermodynamics and Heat Transfer	-	3	-	3	6
86.322 ★ Mechanics of Solids II	3	-	3	-	6
87.302 ★ Aerospace Design and Practice	-	3	-	3	6
94.351 ★ Communication Theory	-	3	-	3/2	5
94.360 ★ Systems and Simulation	3	-	3	-	6
97.350 ★ Digital Electronics	2	-	3	-	5
97.359 ★ Electronics II	3	-	3	-	6
97.398 ★ Physical Electronics	3	-	-	-	4
97.399 ★ Electromagnetic Waves	-	2	-	3	5
	14	15	12	11	54

Aerospace Stream A - Aerodynamics, Propulsion and Vehicle Performance**Fourth Year**

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
86.352 ★ Feedback Control Systems	3	-	1	-	5
86.495 ★ Professional Practice	-	3	-	-	4
87.403 ★ Aerospace Systems Design	3	-	3	-	6
87.432 ★ Applied Aerodynamics and Heat Transfer	3	-	-	-	4
87.436 ★ Aircraft & Spacecraft Performance & Dynamics	3	-	-	-	4
87.438 ★ Aircraft Stability and Control	-	3	-	-	4
87.497 Aerospace Engineering Project	-	-	8	8	9
91.380 ★ Engineering Economics	-	3	-	-	4
Elective Engineering (Note a)	3	-	-	-	4
Elective ★ Engineering (Note a)	-	3	-	-	4
Elective ★ Engineering (Note a)	-	3	-	-	4
	15	15	12	8	52

Note: (a) Selected from available Engineering 86.4xx ★, 87.4xx ★ or 88.4xx ★ courses. Engineering 97.454 ★ is also allowed

**Aerospace Stream B - Aerospace Structures, Systems and Vehicle Design
Fourth Year**

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
86.352★ Feedback Control Systems	3	-	1	-	5
86.412★ Engineering Materials: Strength and Fracture	-	3	-	-	4
86.495★ Professional Practice	-	3	-	-	4
87.403★ Aerospace Systems Design	3	-	3	-	6
87.462★ Introductory Aeroelasticity	-	3	-	-	4
87.468★ Composite Materials	3	-	-	-	4
87.497 Aerospace Engineering Project	-	-	8	8	9
91.380★ Engineering Economics	-	3	-	-	4
Elective★ Engineering (Note a)	3	-	-	-	4
Elective★ Engineering (Note a)	-	3	-	-	4
Elective★ Engineering (Note a)	-	3	-	-	4
	15	15	12	8	52

Note (a) Selected from available Engineering 86.4xx, 87.4xx or 88.4xx courses. Engineering 97.454★ is also allowed

**Aerospace Stream C - Aerospace Electronics and Systems
Fourth Year**

Term		Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
		Fall	Winter	Fall	Winter	
86.495★	Professional Practice	-	3	-	-	4
87.403★	Aerospace Systems Design	3	-	3	-	6
87.497	Aerospace Engineering Project	-	-	8	8	9
91.380★	Engineering Economics	-	3	-	-	4
Elective★	Arts or Social Sciences	-	3	-	-	4
86.352★	Feedback Control Systems	3	-	1	-	5
Three of:						
87.481★	Spacecraft Design	3	-	-	-	4
97.455★	Telecommunication Circuits	3	-	-	-	4
94.460★	Digital Communications	3	-	-	-	4
97.453★	Radio Frequency Lines and Antennas	3	-	-	-	4
Two of:						
94.445★	Introduction to Digital Signal Processing	-	3	-	-	4
97.452★	Microwave Circuits	-	3	-	-	4
97.459★	Communication Links	-	3	-	-	4
97.460★	Radar and Navigation	-	3	-	-	4
97.476★	Digital Integrated Electronics	-	3	-	-	4
		15	15	12	8	52

Civil Engineering Program

Civil engineers play a key role in the development and management of the infrastructure of a country. They are engaged in all aspects related to research, planning, construction and maintenance of bridges, buildings, dams, airports, power stations, highways, subways, transportation networks, harbours, water supply and waste water treatment facilities. Modern civil engineers are called upon to profess their expertise in analysis, computer applications, design and management skills; to plan and execute projects in areas such as energy resources development, engineering for cold climates, hazardous waste management, structural engineering, geotechnical engineering, transportation engineering, and environmental engineering, all of which are of national importance.

The program in Civil Engineering at Carleton University builds upon the common core program which provides a broad background education in engineering, science and mathematics. The Civil Engineering program consists of a set of interrelated courses in structural mechanics, structural engineering, geotechnical engineering and transportation engineering that emphasize the

conceptualization, mathematical modelling, engineering design and solution of problems faced by today's civil engineer.

Many civil engineers also make their careers in practices that are managerial in nature and involve managerial decision making. The managerial aspects of civil engineering and engineering at large are expected to play an increasing role in the future training of engineers. In recognizing this potential the Department of Civil and Environmental Engineering has introduced the degree program in Civil Engineering with "Concentration in Management".

In this program, the Civil Engineering curriculum is complemented by courses in subjects such as management accounting, industrial engineering, operations research and organizational behaviour. Upon satisfactory completion of a prescribed set of courses the students enrolled in the subspecialty will receive the designation "Concentration in Management" on their transcripts.

The interdisciplinary aspects of the program are enhanced by the selection of elective courses in the arts and social sciences listed in

the Engineering Program Guide, which is available from the Faculty Registrar Services office.

Co-operative Industrial Experience Program Option

The Department of Civil and Environmental Engineering offers a Co-operative Industrial Experience option for eligible students. Upon satisfactory completion of the option, students will receive the designation B.Eng. (Co-operative Industrial Experience Op-

tion) on their transcript. For details, refer to Co-operative Education Section on p. 39.

Suggested Engineering Electives

81.303★, 82.420★, 82.421★, 82.422★, 82.431★, 82.432★, 82.433★, 82.437★, 82.438★, 82.440★, 82.443★, 82.450★

Additional Electives available for Management Concentration

82.428★, 82.429★, 82.447★, 42.254★, 42.211★, 42.312★, 42.360★, 42.415★, 42.435★, 42.467★

Civil: General Second Year

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
67.244★ Engineering Geology	-	3	-	3	6
69.204★ Multivariable Calculus for Engineering Students	4	-	-	-	5
69.375★ Mathematical Methods I	-	4	-	-	5
69.257★ Introduction to Statistics	-	4	-	-	5
82.104★ Surveying (see Note a)	-	-	-	-	4 (Spring)
82.211★ Mechanics II	3	-	3	-	
82.220★ Mechanics of Deformable Bodies	3	-	3	-	6
82.270★ Civil Engineering Materials	-	3	-	3	6
86.230★ Fluid Mechanics I	-	3	-	3	6
86.240★ Thermodynamics and Heat Transfer	3	-	3	-	6
91.266★ Numerical Methods	3	-	1	-	4
					56
	16	17	10	9	+4
					(Spring)

Note: (a) Students are encouraged to take Engineering 82.104★ (Surveying) in either the First or Second year of their Engineering program. Lectures and field work three weeks at the beginning of the Spring term.

Civil: General Third Year

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
82.322★ Advanced Mechanics	-	3	-	3/2	5
82.323★ Structural Analysis I	3	-	3/2	-	5
82.324★ Introduction to Structural Design	3	-	3/2	-	5
82.325★ Design of Steel Components	-	3	-	3/2	5
82.326★ Design of Reinforced Concrete Components	-	3	-	3/2	5
82.328★ Geotechnical Mechanics	3	-	3/2	-	5
82.334★ Transportation Engineering and Planning	-	3	-	3/2	5
91.380★ Engineering Economics	3	-	-	-	4
97.365★ Electrical Engineering	-	3	-	3/2	5
Elective★ Arts or Social Sciences	-	3	-	-	4
	16	15	6	6	48

Engineering**Civil: General
Fourth Year**

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
82.428★ Geotechnical Engineering	3	-	3/2	-	5
82.429★ Highway Engineering	-	3	-	3/2	5
82.447★ Municipal Engineering	3	-	3/2	-	5
82.495★ Professional Practice	-	3	-	3/2	4
82.497 Engineering Project	-	-	8	8	9
Two of:					
82.420★ Matrix Analysis of Framed Structures	3	-	3/2	-	5
82.432★ Reinforced and Prestressed Concrete Design	3	-	3/2	-	5
82.433★ Urban Planning	3	-	3/2	-	5
82.437★ Municipal Hydraulics	3	-	3/2	-	5
82.440★ Construction/Project Management	3	-	3/2	-	5
82.443★ Masonry Design	3	-	3/2	-	5
Two of:					
81.303★ Water Resources Engineering	-	3	-	1	5
82.421★ Finite Element Methods in Structural Analysis	-	3	-	3/2	5
82.422★ Wood Engineering	-	3	-	3/2	5
82.431★ Foundation Engineering	-	3	-	3/2	5
82.438★ Behaviour and Design of Steel Structures	-	3	-	3/2	5
82.450★ Computer Methods in Civil Engineering	-	3	-	3/2	5
Elective★ Arts or Social Sciences	3	-	-	-	4
Elective★ Arts or Social Sciences	-	3	-	-	4
	15	15	14	12.5	56

Concentration in Management**Civil: Concentration In Management
Second Year**

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
42.313★ Introduction to Organizational Theory	-	3	-	-	4
42.270★ Accounting Fundamentals	3	-	-	-	4
67.244★ Engineering Geology	-	3	-	3	6
69.204★ Multivariable Calculus for Engineering Students	4	-	-	-	5
69.257★ Introduction to Statistics	-	4	-	-	5
82.104★ Surveying (Note a)	-	-	-	-	4 (spring)
82.211★ Mechanics II	3	-	3	-	6
82.220★ Mechanics of Deformable Bodies	3	-	3	-	6
82.270★ Civil Engineering Materials	-	3	-	3	6
86.230★ Fluid Mechanics I	-	3	-	3	6
91.266★ Numerical Methods	3	-	1	-	5
	16	16	7	9	53
					+4 (Spring)

Note: (a) Students are encouraged to take Engineering 82.104★ (Surveying) in either the First or Second year of their Engineering program. Lectures and field work three weeks at the beginning of the Spring term.

**Civil: Concentration in Management
Third Year**

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
42.224★ Basic Marketing	-	3	-	-	4
82.322★ Advanced Mechanics	-	3	-	3/2	5
82.323★ Structural Analysis I	3	-	3/2	-	5
82.324★ Introduction to Structural Design	3	-	3/2	-	5
82.325★ Design of Structural Steel Components	-	3	-	3/2	5
82.326★ Design of Reinforced Concrete Components	-	3	-	3/2	5
82.328★ Geotechnical Mechanics	3	-	3/2	-	5
82.334★ Transportation Engineering and Planning	-	3	-	3/2	5
91.380★ Engineering Economics	3	-	-	-	4
97.365★ Electrical Engineering	3	-	3/2	-	5
	15	15	6	6	48

**Civil: Concentration in Management
Fourth Year**

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
82.440 ★ Construction/Project Management	3	-	-	-	5
82.495 ★ Professional Practice	-	3	-	-	4
82.497 ★ Engineering Project	-	-	8	8	9
94.320 ★ Industrial Engineering	3	-	-	-	4
Two of:					
82.420 ★ Matrix Analysis of Framed Structures	3	-	3/2	-	4
82.428 ★ Geotechnical Engineering	3	-	3/2	-	5
82.432 ★ Reinforced and Prestressed Concrete Design	3	-	3/2	-	5
82.433 ★ Urban Planning	3	-	3/2	-	5
82.437 ★ Municipal Hydraulics	3	-	3/2	-	5
82.443 ★ Masonry Design	3	-	3/2	-	5
82.447 ★ Municipal Design	3	-	3/2	-	5
One of:					
42.211 ★ Introduction to Organizational Behaviour	-	3	-	-	4
42.254 ★ Essentials to Business Finance	-	3	-	-	4
Two of:					
81.303 ★ Water Resources Engineering	-	3	-	1	5
82.421 ★ Finite Element Methods in Structural Analysis	-	3	-	3/2	5
82.422 ★ Wood Engineering	-	3	-	3/2	5
82.429 ★ Highway Engineering	-	3	-	3/2	5
82.431 ★ Foundation Engineering	-	3	-	3/2	5
82.438 ★ Behaviour and Design of Steel Structures	-	3	-	3/2	5
82.450 ★ Computer Methods in Engineering	-	3	-	3/2	5
Two of:					
42.312 ★ Human Resources Management	-	3	-	-	4
42.360 ★ Small Business Management	-	3	-	-	4
42.415 ★ Organizational Development and Change	-	3	-	-	4
42.435 ★ Operations Research II	-	3	-	-	4
42.467 ★ Management of Technology and Innovation	-	3	-	-	4
	12	18	12.5	11	54

Communications Engineering Program

Communications Engineering is a new program, growing out of Computer Systems Engineering and Electrical Engineering, that is concerned with the reliable, effective, and economical generation, distribution and reception of information. Communications Engineers will be responsible for the planning, analysis and design, implementation, operation, testing, maintenance and management of communication systems and distributed information systems. Such engineers will play an essential role in the creation, deployment and operation of the information systems that modern society depends on. They will be employed as the architects and implementers of the communications facilities that will meet the information needs of all manner of commercial, institutional and industrial users; and be active in the development of new generations of integrated voice, data and image telecommunication systems and universal personal communications.

The Communications Engineering degree provides an undergraduate engineering education that has a broad foundation in basic mathematics, physical science and the engineering sciences and technology. Students will receive a comprehensive education ranging from communications theory and practice to distributed information systems, including radio links, switching and networks and regulatory and social issues, with a strong background in real-time computer systems and software engineering.

Graduates of the new program will be knowledgeable concerning common carrier practices, network and switching theory, and standards. They will have had the opportunity to study wire, radio and optical transmission systems, as well as the design and synthesis of voice, data and image networks. They will study data network protocols, traffic analysis and transmission line theory in a single program along with broadcasting and television and advanced applications of integrated electronics and digital signal processing.

The First year of the curriculum is the standard core program of the Carleton University engineering program. In Second year students take the foundation courses in Computer Systems Engineering and Electrical Engineering, as well as an introductory course in Communication Theory. In Third year, students take courses in Electronics, Digital Signal Processing, Linear Systems Theory, Electromagnetic Theory, Probability, Object-Oriented Programming, Computer Communications, Communications Theory and Communications Software. In Fourth Year, students enhance their coverage of communications with courses in Digital Communications, Distributed Network Processing, Telecommunications Engineering, and Communication Systems Analysis and Design.

Engineering**Communications Engineering
Second Year**

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
69.204★ Multivariable Calculus for Engineering Students	4	-	-	-	5
94.201★ Foundations of Computer Systems	3	-	2	-	5
94.202★ Program Design and Construction	3	-	2	-	5
97.251★ Circuits and Signals	3	-	3	-	6
23.100★ Communication Skills for Engineering Students	-	-	3	-	4
69.375★ Mathematical Methods I	-	4	-	-	5
94.203★ Introduction to Real-Time Systems	-	3	-	2	5
94.250★ Introduction to Communication Theory	-	3	-	3/2	5
97.257★ Electronics I	-	3	-	3	6
97.267★ Switching Circuits	-	3	-	3/2	5
	13	16	12	11	51

**Communications Engineering
Third year**

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
69.265★ Probability Models	4	-	-	-	5
97.359★ Electronics II	3	-	3	-	6
94.352★ Introduction to Communications Software	3	-	3	-	6
97.350★ Digital Electronics	2	-	3	-	5
97.315★ Basic EM and Power Engineering	3	-	3/2	-	5
94.353★ Communication Theory II	-	3	-	3/2	5
94.445★ Introduction to Digital Signal Processing	-	3	-	3/2	5
94.462★ Introduction to Computer Communications	-	3	-	3/2	5
94/97.395★ Professional Practice	-	3	-	-	4
94.204★ Object Oriented Programming Laboratory	-	2	-	3	5
	15	14	10.5	10.5	51

**Communications Engineering
Fourth Year**

Term		Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
		Fall	Winter	Fall	Winter	
94.499	Engineering Project	-	-	8	8	9
94.464★	Digital Communication Theory	3	-	3/2	-	5
94.454★	Distributed Network Processing	3	-	-	-	4
91.380★	Engineering Economics	3	-	-	-	4
Elective★	Engineering Elective (Note a)	3	-	3/2	-	5
94.470★	Telecommunications Engineering	-	3	-	3/2	5
94.471★	Communication Systems Analysis and Design	-	2	-	4	5
Elective★	Engineering Elective (Note a)	-	3	-	3/2	5
Elective★	Engineering Elective (Note a)	-	3	-	3/2	5
Elective	Arts or Social Sciences	3	3	-	-	7
		15	14	11	16.5	54

Note (a) It is required that students select at least 1.0 credit from the following list of courses: 94.457★ Architecture of Computer Systems, 94.405★ Discrete Simulation and Its Applications, 97.399★ Electromagnetic Waves, 97.459★ Communication Links, 97.461★ Microprocessor Systems, 97.476★ Digital Integrated Electronics, 97.478★ Advanced Digital Integrated Circuit Design. One of these, or any 94.4xx★ or 97.4xx★ course may be selected to fulfill the other 0.5 credit requirement.

Computer Systems Engineering Program

The study of Computer Systems Engineering centres around the design, analysis and implementation of engineering systems that have computers as components. A Computer Systems Engineer is one who can combine advanced software and hardware to build such systems, subject to economic and performance constraints. The Computer Systems Engineering program aims to provide students with an excellent foundation in the principles, methods, computer tools and elements of professional practice for this purpose.

At Carleton University, students following the program in Computer Systems Engineering will take courses from the Departments of Electronics and Systems and Computer Engineering. Information on courses offered in the program may be obtained in the calendar sections for those two departments.

Students in the final three years in the Computer Systems Engineering program at Carleton University build upon the broad background in engineering developed in the common core program of the first year. While the Third and Fourth years have some

commonality with the Electrical Engineering program, Computer Systems engineers concentrate primarily on digital logic, computer systems organization and design, and communications systems and software engineering. In addition, students may take a number of electives either to broaden their background or to provide further specialized knowledge in the areas of telecommunications, systems engineering, and microelectronics.

Suggested Engineering Electives

88.453★, 91.266★

Any Third- or Fourth-year course numbered 94.xxx★ or 97.xxx★ for which the prerequisite and other noted constraints are satisfied.

Computer Systems Co-operative Education Option

The Department of Systems and Computer Engineering offers a Co-operative Education Option for eligible students. Upon satisfactory completion of the option, students will receive the designation B.Eng. (Co-operative Education Option) on their transcripts. For details, refer to the Co-operative Education section on p. 39.

Computer Systems Second Year

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
69.204★ Multivariable Calculus for Engineering Students	4	-	-	-	5
69.375★ Mathematical Methods I	-	4	-	-	5
86.211★ Engineering Dynamics	3	-	3	-	6
94.201★ Foundations of Computer Systems	3	-	2	-	5
94.202★ Program Design and Construction	3	-	2	-	5
94.203★ Introduction to Real-Time Systems	-	3	-	2	5
94.204★ Object Oriented Programming Laboratory	-	2	-	3	5
97.251★ Circuits and Signals	3	-	3	-	6
97.257★ Electronics I	-	3	-	3	6
97.267★ Switching Circuits	-	3	-	3/2	5
	16	15	10	8.5	54

Computer Systems Third year

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
69.352★ Probability and Statistics	-	4	-	-	5
91.380★ Engineering Economics	3	-	-	-	4
94.301★ Operating Systems and Data Bases	3	-	-	-	4
94.310★ Systems Analysis	3	-	-	-	4
94.333★ Real-Time Concurrent Systems	-	2	-	3	5
94.351★ Communication Theory	-	3	-	3/2	5
94.360★ Systems and Simulation	3	-	3	-	6
94.361★ Microprocessor Systems	-	3	-	3/2	5
94.395★ Professional Practice	-	3	-	-	4
97.350★ Digital Electronics	3	-	3	-	6
	15	15	6	6	48

**Computer Systems
Fourth year**

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
94.457 ★ Architecture of Computer Systems	-	3	-	-	4
94.462 ★ Introduction to Computer Communications	3	-	3/2	-	5
94.480 ★ Software Engineering	3	-	3/2	-	5
94.485 ★ Computer Systems Design Laboratory	-	2	-	4	5
94.498 Engineering Project (Note a)	-	-	8	8	9
97.475 ★ Electronic Materials, Devices and Media	3	-	-	-	4
Elective Engineering (Note b)	-	3	-	3/2	5
Elective Engineering (Note b)	3	-	3/2	-	5
Elective Engineering (Note b)	-	3	-	3/2	5
Elective Arts or Social Sciences	3	3	-	-	7
	15	14	14	15	54

Note: (a) See course description to determine appropriate course number.

(b) Selected from the list of Suggested Engineering electives

Electrical Engineering Program

Electrical engineers are engaged in research, design, development and production associated with a wide variety of electrical devices and systems. Examples include electronic circuit design and fabrication, and the design and application of communications systems, computers, and power systems. Opportunities exist for electrical engineers in industry, government and education.

At Carleton University, students following the program in Electrical Engineering will take courses from the Departments of Electronics and Systems and Computer Engineering. Information on courses offered in the program may be obtained in the calendar sections for those two departments.

The First year of the Engineering program provides a broad common background of technical fundamentals. The next three years of Electrical Engineering concentrate primarily on electronics, telecommunications and computers. The wide selection of Fourth year electives tends to reflect the technology-driven industry in the Ottawa area. Integrated circuit design and fabrication, telecommu-

nications systems, and computer software are specializations which are particularly well covered at Carleton. Students may choose elective courses from the list of specializations given below.

Suggested Electives

87.430 ★, 88.443 ★, 88.453 ★, 88.474 ★, 88.475 ★, 94.310 ★, 94.320 ★, 94.401 ★, 94.405 ★, 94.415 ★, 94.445 ★, 94.455 ★, 94.457 ★, 94.460 ★, 94.462 ★, 94.464 ★, 94.470 ★, 97.452 ★, 97.453 ★, 97.455 ★, 97.456 ★, 97.460 ★, 97.469 ★, 97.470 ★, 97.475 ★, 97.476 ★, 97.477 ★, 97.478 ★, 97.496 ★

Electrical Co-operative Education Option

The Department of Electronics offers a Co-operative Education Option for eligible students. Upon satisfactory completion of the option, students will receive the designation B.Eng. (Co-operative Education Option) on their transcripts. For details, refer to the Co-operative Education section on p. 39.

**Electrical Engineering
Second Year**

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
69.204 ★ Multivariable Calculus for Engineering Students	4	-	-	-	5
91.266 ★ Numerical Methods	3	-	1	-	5
97.251 ★ Circuits and Signals	3	-	3	-	6
94.202 ★ Program Design and Construction	3	-	2	-	5
69.375 ★ Mathematical Methods I	-	4	-	-	5
94.204 ★ Object Oriented Programming Laboratory	-	2	-	3	5
97.257 ★ Electronics I	-	3	-	3	6
97.267 ★ Switching Circuits	-	3	-	3/2	5
Elective ★ Arts or Social Sciences	3	-	-	-	4
23.100 ★ Communications Skills for Engineering Students	-	3	-	-	4
	16	15	6	7.5	50

**Electrical
Third Year**

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
94.360 ★ Systems & Simulation	3	-	3	-	6
97.359 ★ Electronics II	3	-	3	-	6
97.350 ★ Digital Electronics	-	3	-	3	6
97.398 ★ Physical Electronics	3	-	3/2	-	5
97.315 ★ Basic EM & Power Engineering	3	-	3/2	-	5
69.352 ★ Probability & Statistics	-	4	-	-	5
94.306 ★ Computer Organization	3	-	2	-	5
94.351 ★ Communication Theory	-	3	-	3/2	5
97.395 ★ Professional Practice	-	3	-	-	4
97.399 ★ Electromagnetic Waves	-	-	3	3/2	5
	15	16	11	6	52

**Electrical
Fourth Year**

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
97.461 ★ Microprocessor Systems	3	-	3/2	-	5
94/97.497 Engineering Project (Note a)	-	-	8	8	9
91.380 ★ Engineering Economics	-	3	-	-	4
Elective ★ Engineering (Note b)	3	-	3/2	-	5
Elective ★ Engineering (Note b)	3	-	3/2	-	5
Elective ★ Engineering (Note b)	3	-	3/2	-	5
Elective ★ Engineering (Note b)	-	3	-	3/2	5
Elective ★ Engineering (Note b)	-	3	-	3/2	5
Elective ★ Engineering (Note b)	-	3	-	3/2	5
Elective ★ Science or Engineering (Note c)	-	3	-	3/2	5
Elective ★ Arts or Social Sciences	3	-	-	-	4
	15	15	14	14	58

Note: (a) Register in 97.497 if your advisor is in Electronics. Register in 94.497 if your advisor is in Systems and Computer Engineering.
 (b) Selected from 87.430 ★, 88.443 ★, 88.453 ★, 88.474 ★, 88.475 ★, 94.204 ★, 94.310 ★, 94.320 ★, 94.4xx ★, 97.4xx ★.
 (c) Selected from 8x.Yxx ★ (Y > -2) or "Acceptable for Scientific Credit" courses from the list "Classification of Electives for Engineering Students" in the "Engineering Program Guide" available from the Registrarial Services office for Engineering; or as per note (b)
 (d) Elective course weights vary between 4 and 5 depending on the course laboratory content.

Suggested Elective Courses for Specialization in Computers

97.478 ★, 97.476 ★, 94.401 ★, 94.457 ★

Suggested Elective Courses for Specialization in Communication Electronics

97.455 ★, 97.453 ★, 97.476 ★, 94.445 ★, 97.477 ★, 97.452 ★

Suggested Elective Courses for Specialization in Telecommunication Systems

94.462 ★, 94.460 ★, 97.476 ★, 94.445 ★, 97.459 ★, 94.464 ★, 94.470 ★

Suggested Elective Courses for Specialization in Microelectronics

97.469 ★, 97.470 ★, 97.477 ★, 97.478 ★

Engineering Physics

Engineering Physics is concerned with the application of fundamental physical science to research and development in Engineering and Physics. Physics Engineers will be well versed in the fundamental science and technology of semiconductor devices, optical systems and devices, telecommunications and related computer technologies. A broad base in applied physics and electronics makes them well suited to work in a large number of high technology industries, including integrated circuit fabrication, electronic devices, microwave and optical systems and sensor technology. With appropriate choice of optional courses, students in this program could also pursue graduate studies in either engineering or pure and applied physics.

Engineering Physics is a progressive co-op only program; exceptions can only be made by the Engineering Physics Steering Committee. It is a highly competitive program with restricted enrolment. Those not fulfilling the continuation requirements may be eligible to transfer to other programs in engineering or science. The first year provides a basic background in mathematics, basic science, problem solving and also a specialized team design course. In the second and third years fundamental concepts in electronics and applied physics are introduced and expanded on. The fourth year allows the student sufficient flexibility to specialize in topics such as semiconductor devices and fabrication or applied optics. The program is a collaboration between the Department of Electronics and the Physics Department.

Engineering

Engineering Physics First Year

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
23.100 ★ Communication Skills for Engineering Students	-	1	-	2	4
65.111 ★ Chemistry for Engineering Students	3	-	3	-	6
69.104 ★ Calculus for Engineering Students	3	-	1	-	5
69.105 ★ Differential Equations	-	3	-	1	5
69.114 ★ Linear Algebra for Engineering Students	-	3	-	1	5
75.101 ★ Introductory Physics I	4	-	3	-	6
75.102 ★ Introductory Physics II	-	4	-	3	6
91.166 ★ Problem Solving and Computers	3	-	1	-	5
97.198 ★ Engineering Team Design	-	2	-	4	5
Elective ★ Arts or Social Sciences	3	-	-	-	4
	16	13	8	11	51

Engineering Physics Second Year

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
69.204 ★ Multivariable Calculus	4	-	-	-	5
69.375 ★ Mathematical Methods	-	4	-	-	5
75.222 ★ Wave Motion and Optics	-	3	3	-	6
75.264 ★ Modern Physics I	3	-	3	-	6
94.202 ★ Program Design and Construction	3	-	2	-	5
94.204 ★ Object Oriented Programming Laboratory	-	2	-	3	5
91.266 ★ Numerical Methods	3	-	1	-	5
97.251 ★ Circuits and Signals	3	-	3	-	6
97.257 ★ Electronics I	-	3	-	3	6
97.267 ★ Switching Circuits	-	3	-	3/2	5
	16	15	9	7.5	42

Engineering Physics Third Year

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
69.352 ★ Probability and Statistics	-	4	-	-	5
75.364 ★ Modern Physics II	-	3	-	3/2	4
75.371 ★ Elements of Quantum Mechanics	3	-	-	-	4
75.387 ★ Mathematical Physics I	3	-	-	-	4
94.351 ★ Communication Theory	-	3	-	3/2	5
97.315 ★ Basic EM and Power	3	-	3/2	-	5
97.350 ★ Digital Electronics	3	-	3	-	5
97.359 ★ Electronics II	-	3	-	3	6
97.398 ★ Physical Electronics	3	-	3/2	-	5
97.399 ★ Electromagnetic Waves	-	3	-	3/2	5
	15	16	6	7.5	48

**Engineering Physics
Fourth Year**

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
75.408 ★ Advanced Physical Lab	-	-	-	6	6
75.477 ★ Introduction to Quantum Mechanics I	3	-	-	-	4
75.4xx ★ Physics Elective	3	-	3	-	4
75.4xx ★ Physics Elective	-	3	-	3	4
91.380 ★ Engineering Economics	3	-	-	-	4
97.395 ★ Professional Practice	-	3	-	-	4
97.497 Engineering Project	-	-	8	8	9
97.4xx ★ Engineering Elective (note a)	3	-	3/2	-	5
97.4xx ★ Engineering Elective (note a)	-	3	-	3/2	5
Elective ★ Arts or Social Sciences	3	-	-	-	4
Elective ★ Arts or Social Sciences	-	3	-	-	4
	15	12	12.5	18.5	53

Note: (a) Selected from 97.4xx ★

Environmental Engineering Program

Environmental Engineering focuses on management and protection of the environment and on the development of engineered solutions which minimize the threat to human health. Environmental engineers play a major role in the development of technically sound and economically feasible solutions to air and water pollution, noise pollution, and hazardous and toxic waste management. They deal with issues related to landfills and solid waste management, remediation of contamination, ecosystem protection and preservation, and the development of sustainable and environmentally safe methods for the allocation, development and utilization of natural and renewable resources.

Environmental Engineering is a multidisciplinary activity. Environmental engineers work closely with professionals from many other disciplines including biologists, chemists, economists, sociologists, lawyers, political scientists, urban and regional planners and others who play an integral role in defining and designing sustainable developments.

The program in Environmental Engineering at Carleton is structured to provide the undergraduate with sound training in the environmental aspects of chemistry and biology, which are considered essential to the in-depth appreciation of environmental problems.

The engineering component of the undergraduate degree consists of a strong engineering common core which emphasizes the pure sciences, engineering analysis, computer applications and engineering design. The Environmental Engineering component in the undergraduate degree program consists of a set of well structured courses that emphasize the conceptualization, mathematical modeling, engineering design and solution of problems in Environmental Engineering. The scientific and engineering aspects of the program prepare the ground for design and synthesis courses such as environmental planning and decision making and environmental impact assessment. The interdisciplinary aspects of the program are enhanced by the selection of elective courses in the arts and social sciences, which emphasize management, ethics, economics and law, as they relate to the environment. These courses are scheduled in the first and fourth years of the regular program and can be selected from the list in the Engineering Program Guide, which is available from the Faculty Registrarial Services office.

Engineering Electives

The engineering electives in the fourth year of the program must be selected from the following list unless alternatives are approved by the Department.

81.402 ★, 82.334 ★, 82.428 ★, 82.431 ★, 82.433 ★, 82.440 ★, 87.430 ★, 88.443 ★, 88.446 ★, 88.464 ★, 94.320 ★

**Environmental Engineering
Second Year**

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
65.280 ★ Environmental Chemistry	3	-	3	-	6
67.244 ★ Engineering Geology	-	3	-	3	6
69.204 ★ Multivariable Calculus for Engineering Students	4	-	-	-	5
69.257 ★ Introduction to Statistics	-	4	-	-	5
81.201 ★ Process Analysis for Environmental Engineering	-	2	-	3	5
81.202 ★ Microbiology	-	3	-	-	4
82.220 ★ Mechanics of Deformable Bodies	3	-	3	-	6
86.230 ★ Fluid Mechanics I	-	3	-	3	6
86.240 ★ Thermodynamics and Heat Transfer	3	-	3	-	6
91.266 ★ Numerical Methods	3	-	1	-	5
	16	15	10	9	54

**Environmental Engineering
Third Year**

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
61.364 ★ Analysis of Ecological Relationships	-	-	-	4	3
65.232 ★ Analytical Chemistry I	3	-	3	-	6
81.301 ★ Environmental Engineering Unit Operations	-	3	-	3/2 + 1	6
81.302 ★ Environmental Engineering Systems Modelling	3	-	3/2 + 1	-	6
81.303 ★ Water Resources Engineering	-	3	-	1	5
81.304 ★ Containment and Pollutant Transport in the Environment	-	3	-	1	5
82.270 ★ Civil Engineering Materials	-	3	-	3	6
82.328 ★ Geotechnical Mechanics	3	-	3/2	-	5
82.437 ★ Municipal Hydraulics	3	-	3/2	-	5
91.380 ★ Engineering Economics	3	-	-	-	4
	15	12	8.5	11.5	51

**Environmental Engineering
Fourth Year**

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
81.403 ★ Air Pollution and Emissions Control	3	-	3/2 + 1	-	6
81.405 ★ Environmental Engineering Unit Processes	3	-	3/2 + 1	-	6
81.406 ★ Hydrogeology and Groundwater	-	3	-	3/2	5
81.411 ★ Waste Management	3	-	1	-	5
81.414 ★ Environmental Planning and Impact Assessment	-	3	-	3/2	5
81.497 Engineering Project	-	-	8	8	9
82.495 ★ Professional Practice	-	3	-	-	4
Elective ★ Engineering (Note a)	3	-	3/2	-	5
Elective ★ Engineering (Note a)	-	3	-	3/2	5
Elective ★ Arts or Social Sciences	3	-	-	-	4
	15	12	15.5	12.5	45

Note: (a) Selected from the specified list; the actual weight is the assigned weight of the particular course.

Mechanical Engineering Program

Mechanical Engineering by its nature is a highly diversified discipline, encompassing a range of activities from manufacturing processes and design to energy conversion and conservation. The main topic areas of the discipline are solid mechanics and materials, fluid mechanics and thermo-sciences which together provide the breadth necessary for the graduate mechanical engineer.

At Carleton University, students in their final three years in the Mechanical Engineering program will build upon the broad background in engineering developed in the first year common core program. In addition to the continued major emphasis on design, dynamics, thermodynamics and heat transfer, the student can choose elective courses that span a wide range of applied subjects like noise control, energy conversion and power generation, vehicle technology, aerodynamics and flight mechanics, automatic controls, etc., which reflect the wide range of interests of faculty members of the Department of Mechanical and Aerospace Engineering. In addition, the fourth-year student completes a major project on a topic of current interest in mechanical or aerospace engineering.

In select cases, students of high academic standing may be able to coordinate Engineering 88.497 project work with Masters thesis work in such a way that they can complete a M.Eng. program about one year after obtaining their B.Eng. degree. Interested students

should consult the Departmental Chair or Supervisor of Graduate Studies near the end of their Third year.

Suggested Engineering Electives

Any course numbered 86/87/88 for which the prerequisite and other nonstraints are satisfied.

Co-operative Industrial Experience Program Option

The Department of Mechanical and Aerospace Engineering offers a Co-operative Industrial Experience Program Option for eligible students. Upon satisfactory completion of the option, students will receive the designation B.Eng. (Co-operative Industrial Experience Option) on their transcripts. For details, refer to Co-operative Industrial Experience Section on p. 39.

Spacecraft Design

Aspects of spacecraft design are covered in both the Aerospace Program (Streams A, B and C), and also in the Mechanical Program, therefore both Aerospace and Mechanical students may follow their interests and accommodate this area of study. Mechanical students can achieve this by choosing appropriate electives such as 87.481 ★, 88.451 ★, 88.453 ★, together with the Space related individual project 88.497.

Mechanical Engineering with Concentration in Computer-Integrated Manufacturing

A special concentration in Computer-Integrated Manufacturing (CIM) is available for students with an interest in this area. The concentration is designed to provide an understanding of the issues, concepts and techniques of applying computer technology to design and manufacturing. The concentration consists of the following courses: Year Three: One of Business 42.101 ★, 42.211 ★,

Year Four: Engineering 91.380 ★ and three of Engineering 87.434 ★, 88.451 ★, 88.453 ★, 88.464 ★, 88.474 ★, 88.475 ★, 94.310 ★.

The booklet *Engineering Program Guide*, available from the Faculty Registrar Services office should be consulted for the appropriate selection of elective choices for this program. Students who wish to follow the CIM concentration should declare their intention at the beginning of the Second year. Those who successfully complete this option will receive the designation "Concentration in Computer Integrated Manufacturing" on their transcripts.

Mechanical Second Year

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
69.204 ★ Multivariable Calculus for Engineering Students	4	-	-	-	5
69.375 ★ Mathematical Methods I	-	4	-	-	5
86.201 ★ Engineering Graphics and Design	-	2	-	4	5
86.211 ★ Engineering Dynamics	3	-	3	-	6
86.222 ★ Mechanics of Solids I	3	-	3	-	6
86.230 ★ Fluid Mechanics I	-	3	-	3	6
86.240 ★ Thermodynamics and Heat Transfer	3	-	3	-	6
86.270 ★ Introduction to Engineering Materials	-	3	-	3	6
91.266 ★ Numerical Methods	-	3	-	1	4
23.100 ★ Communication Skills for Engineering Students	-	-	3	-	4
	13	15	12	11	53

Mechanical Third Year

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
69.352 ★ Probability and Statistics	-	4	-	-	5
86.304 ★ Dynamics of Machinery	3	-	1	-	5
86.322 ★ Mechanics of Solids II	3	-	3	-	6
86.330 ★ Fluid Mechanics II	3	-	3	-	6
86.340 ★ Applied Thermodynamics	-	3	-	1	5
86.491 ★ Mechanical and Aerospace Engineering Lab	-	1	-	5	5
88.302 ★ Machine Design and Practice	-	3	-	3	6
88.370 ★ Principles of Manufacturing Engineering	-	3	-	1	5
94.360 ★ Systems and Simulation	3	-	3	-	6
97.365 ★ Electrical Engineering	3	-	3/2	-	5
	15	14	11.5	11	54

Mechanical Fourth Year

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
86.352 ★ Feedback Control Systems	3	-	1	-	5
86.412 ★ Engineering Materials: Strength and Fracture	3	-	-	-	4
86.491 ★ Mechanical & Aerospace Engineering Lab	1	-	5	-	5
86.495 ★ Professional Practice	-	3	-	-	4
88.403 ★ Mechanical Systems Design	3	-	3	-	6
88.446 ★ Heat Transfer	3	-	-	-	4
88.497 ★ Engineering Project	-	-	8	8	9
91.380 ★ Engineering Economics	-	3	-	-	4
Elective ★ Engineering (Note a)	3	-	-	-	4
Elective ★ Engineering (Note a)	-	3	-	-	4
Elective ★ Engineering (Note a)	-	3	-	-	4
Elective ★ Engineering (Note a)	-	3	-	-	4
	15	15	12	8	52

Note: (a) Selected from available Engineering 86.4xx, 87.4xx or 88.4xx courses

**Mechanical-Computer Integrated Manufacturing Option
Third Year**

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
69.352 ★ Probability and Statistics	-	4	-	-	5
86.304 ★ Dynamics of Machinery	3	-	1	-	5
86.322 ★ Mechanics of Solids II	3	-	3	-	6
86.330 ★ Fluid Mechanics II	3	-	3	-	6
86.491 ★ Mechanical and Aerospace Engineering Lab	-	1	-	5	5
88.302 ★ Machine Design and Practice	-	3	-	3	6
88.370 ★ Principles of Manufacturing Engineering	-	3	-	1	5
94.360 ★ Systems and Simulation	3	-	3	-	6
97.365 ★ Electrical Engineering	3	-	3/2	-	5
One of:					
42.101 ★ Principles of Financial Accounting	-	3	-	-	4
42.210 ★ Management and Organizational Behaviour	-	3	-	-	4
	15	14	11.5	9	53

**Mechanical - Computer Integrated Manufacturing Option
Fourth Year**

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
86.352 ★ Feedback Control Systems	3	-	1	-	5
86.412 ★ Engineering Materials: Strength and Fracture	3	-	-	-	4
86.495 ★ Professional Practice	-	3	-	-	4
88.403 ★ Mechanical Systems Design	3	-	3	-	6
88.446 ★ Heat Transfer	3	-	-	-	4
88.497 Engineering Project	-	-	8	8	9
91.380 Engineering Economics	-	3	-	-	4
Elective ★ Engineering (Note a)	3	-	-	-	4
Three of:					
87.434 ★ Computational Fluid Dynamics	-	3	-	-	4
88.451 ★ State Space Modelling and Control Techniques	-	3	-	-	4
88.453 ★ An Introduction to Robotics	-	3	-	-	4
88.464 ★ Finite Element Methods	-	3	-	-	4
88.474 ★ Computer Integrated Manufacturing Systems	-	3	-	-	4
88.475 ★ CAD/CAM	-	3	-	-	4
	15	15	12	8	52

Note (a): Selected from available Engineering 86.4xx 87.4xx or 88.4xx courses. Engineering 97.454 ★ is also allowed

Software Engineering Program

Software Engineering is concerned with both the process of developing software and with the quality of the product. This includes correct, timely, reliable, safe and secure operations on information; with its communication, storage and presentation; with rapid, economical and correct development of software; and with understanding users' needs in situations where these are not clear. Software Engineers will understand tools such as languages for programming and for defining requirements, designs and tests. They will understand software environments, computer technologies, and the physical limitations of the technologies. They will be responsible for planning, analysis, design, implementation, testing, maintenance and evolution of software systems. Such systems may include data communications, data processing, transaction processing, transportation management (such as air traffic control), communications switching, distributed multimedia systems manipulation sound, images, data, and video, client-server systems and all kinds of network applications. Software engineers will understand how to practice socially responsible engineering, in a situ-

ation where they are at the leading edge of change in society through technology.

Suggested Engineering Electives

97.257 ★, 97.267 ★ Any Third- or Fourth-year course numbered 94.xxx ★ or 97.xx ★ for which the prerequisites and other noted constraints are satisfied.

Suggested Open Electives

Any course selected from (i) the list of suggested Engineering electives or (ii) the list of approved Science and Computer Science courses published in the "Engineering Program Guide" available from the Engineering Registrarial Services Office

Software Engineering Co-operative Education Option

The Department of Systems and Computer Engineering offers a Co-operative Education Option for eligible students. Upon satisfactory completion of the option, students will receive the designation B.Eng. (Co-operative Education Option) on their transcripts. For details, refer to the Co-operative Education section on p. 39.

**Software Engineering
First Year**

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
23.100 ★ Communications Skills for Engineering Students	3	-	-	-	4
69.104 ★ Calculus for Engineering Students	3	-	1	-	5
69.105 ★ Differential Equations and Infinite Series for Engineering Students	-	3	-	1	5
69.114 ★ Linear Algebra for Engineering Students	-	3	-	1	5
75.101 ★ Introductory Physics I	3	-	3	-	6
75.102 ★ Introductory Physics II	-	3	3	-	6
91.100 ★ Orientation to Engineering	3	-	2	-	5
94.110 ★ Introduction to Object-Oriented Computing	3	-	1	-	5
94.111 ★ Object-Oriented Software Development	-	3	1	-	5
94.112 ★ Foundations of Systems Programming	-	3	1	-	5
	15	15	7	7	51

**Software Engineering
Second Year**

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
65.111 ★ Chemistry for Engineering Students	-	3	-	3	6
69.204 ★ Multivariable Calculus for Engineering Students	4	-	-	-	5
69.185 ★ Introduction to Discrete Structures	-	4	-	-	5
91.111 ★ Mechanics I	3	-	3	-	6
94.201 ★ Foundations of Computer Systems	3	2	-	-	5
94.203 ★ Introduction to Real-Time Systems	-	3	-	2	5
94.210 ★ Algorithms and Data Structures	3	2	-	-	5
94.211 ★ Object-Oriented Programming and Design Laboratory	-	2	3	-	5
97.251 ★ Circuits and Signals	3	-	3	-	6
One of:					
97.267 ★ Switching Circuits	-	3	-	3/2	5
94.360 ★ Systems and Simulation	-	3	-	3	6
	16	15	10	9.5	53

**Software Engineering
Third Year**

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Winter	Summer	Winter	Summer	
69.352 ★ Probability and Statistics	4	-	-	-	5
91.380 ★ Engineering Economics	3	-	-	-	4
94.301 ★ Operating Systems and Data Bases	3	-	-	-	4
94.310 ★ Systems Analysis and Design	3	-	-	-	4
94.311 ★ Programming Languages	-	3	-	3/2	5
94/97.395 ★ Professional Practice	-	3	-	-	4
94.333 ★ Real-Time Concurrent Systems	-	2	-	3	5
94.480 ★ Software Engineering	-	3	-	3/2	5
94.405 ★ Discrete Simulation and its Applications	-	3	-	1	5
95.304 ★ Database Management Systems	3	-	-	-	4
	16	14		7	45

Engineering

Software Engineering Fourth Year

Term	Lectures and Tutorials		Laboratories and Problem Analysis		Course Weight
	Fall	Winter	Fall	Winter	
94.411 ★ Software Validation, Verification and Testing	3	-	-	-	4
94.457 ★ Architecture of Computer Systems	-	3	-	-	4
94.416 ★ Software Product Management	3	-	-	-	4
94.486 ★ Software Engineering Laboratory	-	2	-	4	5
94.4xx Engineering Project	-	-	8	8	9
97.475 ★ Electronic Materials, Devices and Media	3	-	-	-	4
Elective ★ Engineering (Note a)	3	-	3/2	-	5
Elective ★ Engineering (Note a)	-	3	3/2	-	5
Elective ★ Open (Note b)	3	-	-	-	4
Elective Arts or Social Sciences	3	3	-	-	7
	15	14	9.5	13.5	51

Note: (a) Selected from the list of Suggested Engineering electives.

(b) Selected from the list of Suggested Open electives

Public Affairs and Management

Academic Administration

Dean, Allan M. Maslove

Associate Dean (Research and Faculty Development),
Katherine Graham

Associate Dean (Undergraduate Programs) To be announced

Secretary of the Faculty Board, Paul Attallah

Associate Dean (Kroeger College of Public Affairs), Eileen
Saunders

Faculty Registrar, Denise McKenna

Directory of Offices

Office of the Dean

Dean 520-3741

Associate Dean (Undergraduate Programs) 520-3741

Associate Dean (Research and Faculty Development) 520-3741

Associate Dean (Kroeger College of Public Affairs) 520-7560

Registrarial Services

D382 Loeb Building

Registrar 520-3902

Student Advising 520-3902

Student Records 520-3902

Business, V. Kumar, Director

710 Dunton Tower, 520-2382

Criminology and Criminal Justice, K. Kelly, Co-ordinator

D485 Loeb Building, 520-2588

Economics, N. Rowe, Chair

C871 Loeb Building, 520-3744

European and Russian Studies, J. Debardeleben, Director

459 Paterson Hall, 520-2886

International Affairs ★, M. Molot, Director

2A59 Paterson Hall, 520-6655

Journalism and Communication, C. Dornan, Director

346 St. Patrick's Building, 520-7404

Law, M. Mac Neil, Chair

C473 Loeb Building, 520-3691

Mass Communication, P. Attallah, Associate Director

310 St. Patrick's Building, 520-7408

Political Economy*, W. Clement, Director

A818 Loeb Building, 520-7414

Political Science, G. Williams, Chair

B640 Loeb Building, 520-2777

Public Administration, F. Abele, Director

1021 Dunton Tower, 520-2547

Public Affairs and Policy Management, E. Saunders, Associate
Dean and Director

Loeb Building, 520-7560

Social Work, TBA, Director

509 Dunton Tower, 520-5601

* **Graduate-level program.** For details please see Graduate Stud-
ies and Research Calendar.

Degree and Certificate Programs

Registrarial Services

Registrar: D. McKenna

Student Advising: J. Clarke, R. Jones

Student Records: S. Bauer

Registrarial Services provided by the Faculty of Public Affairs and Management are a source of general information on the academic programs within the Faculty of Public Affairs and Management and on the regulations which apply within the Faculty. Specific information about course content, subject matter, and the structure of B.A. or B.A. (Honours) programs is obtainable from the academic departments within the Faculty.

The Faculty of Public Affairs and Management offers programs in eight degrees and two certificates.

Bachelor of Arts

B.A. (Honours) and B.A.

The four-year Honours B.A. provides rigorous and extensive study in one or two disciplines. The Honours degree is necessary for entry to certain fields of employment, and is a desirable preparation for graduate studies and professional training, including teaching.

The three-year B.A. program provides a liberal university education of value either as a general intellectual preparation for a great number of non-specialized careers, or as an introduction to subsequent specialized study.

Bachelor of Commerce (B.Com.)

The four-year Honours program provides a foundation in the disciplines essential to careers in business. The program is offered by the School of Business.

Bachelor of International Business (B.I.B.)

The four-year Honours program integrates language training and a year of study abroad with a specialist professional program to provide students with the knowledge, skills and orientation necessary to function effectively in the area of international business.

Bachelor of Journalism (B.J.)

The four-year Honours program is designed to prepare students for careers in the mass media. The program is offered by the School of Journalism and Communication.

Bachelor of Public Administration (B.P.A.)

The four-year Honours program provides a foundation in the disciplines relevant to the practice of public administration. The program is offered by the School of Public Administration. Note: Admission into the Bachelor of Public Administration has been closed.

Bachelor of Public Affairs and Policy Management (B.P.A.P.M.)

The four-year Honours program combines rigorous academic studies with policy-oriented problem-solving and skills development. Specializations are offered in international studies, development studies, human rights, public policy and administration, strategic public opinion and policy analysis, communication and information technology policy and social policy.

Bachelor of Social Work (B.S.W.)

The four-year Honours program combines a liberal arts education with professional preparation. The primary objective of the program is to provide students with the knowledge and skills necessary to begin entry level practice in social work.

Certificate in Public Service Studies (C.P.S.S.)

This is a 6.0 credit program in public service subjects at the undergraduate level. The program is offered by the School of Public Administration.

Certificate in Law Enforcement Studies (C.L.E.S.)

This is a 6.0 credit program designed for persons employed in the area of law enforcement, national security or corrections. The program is co-ordinated by the Departments of Law and of Sociology and Anthropology.

Part-Time Study

Part-time study is a viable method of attaining a degree in the Faculty of Public Affairs and Management.

Part-time students who wish to limit their studies to evening and summer times should note that the following academic unit(s) teach a range of courses in the evening and during the summer that will permit students to complete a major in their discipline.

Economics

Law

Political Science

Students have the choice between full- and part-time registration and may freely alternate between the two.

Students wishing to pursue an Honours degree on a part-time basis are urged to consult with the appropriate academic unit(s) about the scheduling of courses.

Instructional Television

Instructional Television offers an alternative mode of access to courses offered at Carleton University. Your learning experience at Carleton University may include a mix of on-campus and television courses. For detailed information about **itv** refer to p. 57.

Science

Academic Administration

Dean, P.J.S. Watson

Associate Dean and Director of the College of Natural Sciences, I.B. Lambert

Secretary of the Faculty Board, G.R. Carmody

Associate Dean (Planning), B.C. Mortimer

Assistant Dean of Students and Faculty Registrar, B.R. Lifeso

Committee on Admission and Studies, L. Ribes, Chair

Directory of Offices, Chairs, Directors and Advisers

Office of the Dean

3240 Herzberg Laboratories, 520-4388

Office of the Assistant Dean and Registrar

2201 Herzberg Laboratories, 520-4440

School of Mathematics and Statistics, K.S. Williams, Director

4302 Herzberg Laboratories, 520-2155

Office of the College of Natural Sciences

2200 Wing, Herzberg Laboratories

Biology, R.C. Wyndham, Chair*

215 Environmental Laboratories, 520-2600 x 3651

Chemistry, G.W. Buchanan, Chair

203 Steacie Building, 520-3841

Earth Sciences, R.P. Taylor, Chair

320 Tory Building, 520-4400

Geography, C. Burn, Adviser

B349 Loeb Building, 520-2561

Physics, J.C. Armitage, Chair

3302 Herzberg Laboratories, 520-4377

Psychology, J. Logan, Adviser

B550 Loeb Building, 520-2644

Institute of Biochemistry, P. Buist, Director

Institute of Environmental Science, D. Wigfield, Director

Integrated Science Studies Committee, I. Munro, Chair

Biotechnology Co-ordinators, J. Vierula and J. Sinclair

Biology and Geology, S.B. Peck, Chair

Biology and Physical Geography, C. Burn, Chair

Neuroscience, J.B. Kelly, Chair

Chemistry and Geology, R.A. Shigeishi, Chair

Chemistry and Computer Science, R.A. Shigeishi, Chair

Chemistry and Physics, R.A. Shigeishi, Chair

Computer Science and Mathematics, L.D. Nel, Chair

Mathematics and Economics, M.J. Moore, Chair

Mathematics and Physics, M.J. Moore, Chair

Statistics and Economics, M.J. Moore, Chair

Physical Geography and Geology, F.A. Michel, Chair

Science Technology Centre, J.D.E. Wong, Director

General Information

The Faculty of Science consists of the College of Natural Sciences, the School of Computer Science and the School of Mathematics and Statistics. The College of Natural Sciences includes the Departments of Biology, Chemistry, Earth Sciences, and Physics, and the Institutes of Biochemistry and Environmental Science.

School of Computer Science

The program of the School of Computer Science leads to the Bachelor of Computer Science Honours degree. There are streams within the Bachelor of Computer Science in Software Engineering, Network Computing, Management and Business Computing, and Software and Computing. For information on the Bachelor of Computer Science program see p. 196.

School of Mathematics and Statistics

Programs of the School of Mathematics and Statistics lead to Bachelor of Mathematics degrees. Honours and Major programs are available in: Mathematics, Computer Mathematics, and Statistics, as well as the Honours program in Computer Statistics. Combined Honours programs are available in Computer Science and Mathematics, Mathematics and Physics (B.Sc.), Mathematics and Economics and in Statistics and Economics. There are also combined B.Math./M.Sc. programs in Mathematics and in Statistics. For more information on the Bachelor of Mathematics programs see p. 339.

College of Natural Sciences

Programs of the College of Natural Sciences lead to Bachelor of Science degrees.

B.Sc. (Honours) Programs

The Bachelor of Science degree program with Honours is designed for those students who wish to deepen and extend their studies in one particular field or area for the purpose of preparing themselves for graduate studies, or for entrance to a Faculty of Education or other fields of scientific endeavour.

Honours may be taken in Applied Physics, Biochemistry, Biology, Chemistry, Environmental Science, Geology, Integrated Science Studies, Physical Geography, and Psychology.

Bachelor of Science with Honours programs in Computational Sciences are available: Computational Biochemistry, Computational Biology, and Computational Chemistry

Combined Honours may be taken in Biochemistry and Biotechnology, Biology and Biotechnology, Biology and Geology, Biology and Physical Geography, Chemistry and Computer Science, Chemistry and Geology, Chemistry and Physics, Geology and Physical Geography, Mathematics and Physics and Neuroscience. The Integrated Science Studies program allows students to combine a science discipline with a non-science.

The detailed programs are given in the appropriate departmental sections of the Calendar. The Honours program of each student is under the direct supervision of an Honours adviser of the student's department.

B.Sc.(Major) Programs

The Bachelor of Science degree program is designed to provide specialization in one field of study called the Major field while permitting students to select other courses from complementary fields or disciplines in which they have a particular interest. The Major fields include Biochemistry, Biology, Chemistry, Computational Chemistry, Geology, and Integrated Science Studies. The corresponding programs are detailed in the departmental sections of the Calendar.

Co-operative Education Opportunities

Students in the B.C.S., Honours B.Math. and Honours B.Sc. degree programs have the opportunity to enrol in a Co-operative Education option in the degrees offered by the following departments and schools: Biochemistry, Biology, Chemistry, Computer Science Earth Sciences (Geology), Mathematics and Statistics, and Physics.

Students in Combined Honours programs in the Faculty of Science (including Computer Science) are eligible for Co-operative Education options. The number of work-terms required for the Co-op option in a Combined Honours program is the minimum of the number of work-terms required by the two participating individual Honours programs. Students must consult with and have the approval of the committee responsible for the program.

For general information on the Co-operative Education Option, please see p. 39.

Minors

Students of the Faculty of Science may enhance their program with one of the many Minors offered by departments throughout the university. The Faculty of Science offers Minors in Computer Science, Geographic Information Processing, Mathematics, and Statistics.

Science Courses Recommended to Students in Other Faculties*Biology*

61.192★, 61.193★

Chemistry

65.103★

Geology

67.100, 67.104★, 67.105, 67.241★, 67.243★

Physics

75.190

Science

60.101★, 60.102★, 60.201★, 60.202★

Instructional Television

Instructional Television offers an alternative mode of access to courses offered at Carleton University. Your learning experience at Carleton University may include a mix of on-campus and television courses. For detailed information about **itv** refer to p. 57.

Academic Regulations for the Bachelor of Science Degree

Introduction

The three milestones on the path to an undergraduate degree are Admission to the program, Promotion to the credit system (First Year Promotion) and Graduation. This section of the Calendar presents the regulations that apply to these three main events along with other important regulations that apply to students in the Bachelor of Science program.

The regulations presented in this section apply to all Bachelor of Science programs. The regulations applying to the Bachelor of Computer Science program may be found in the School of Computer Science section of the Calendar (p. 196). The regulations applying to the Bachelor of Mathematics programs may be found in the School of Mathematics and Statistics section (p. 339).

Admission Requirements

There are two main categories of admission to an undergraduate program. The normal admission path is directly from secondary school or qualifying-university year. Alternatively, in some circumstances, a student who has obtained university-level credits prior to admission to the Bachelor of Science program may have these credits formally acknowledged on admission. This is described as admission with advanced standing.

Bachelor of Science, Honours Program

Normal Admission to First Year

For admission to the Bachelor of Science Honours program, a student must satisfy one of the following sets of conditions.

1. The OSSD including six OACs with an average of 75 percent or better, or equivalent, including a core consisting of one OAC in calculus and at least two OACs chosen from algebra and geometry, biology, chemistry, and physics. In addition, an average of 75 percent or better is required in the core OACs. The grade offered in OAC calculus must be 60 percent or better. No more than one of the two remaining core courses may be offered with a grade below 60 percent; or

2. The successful completion of 5.0 credits approved for a Qualifying-University year Science program with a GPA of 8.0 or better, including a core of 0.5 credit in calculus and 2.5 credits chosen from biology, chemistry, geology, physics or mathematics. In addition a GPA of 8.0 or better is required in the three-credit core. The grade offered in calculus must be C- or better. No more than one of the two and one half remaining core credits may be offered with a grade below C-

For Honours in Psychology, an OAC in English is recommended.

The Co-operative Education options have a higher admission requirement than that stated above. Please refer to the individual departmental sections for more details.

Students presenting credits for one or more repeated subjects or courses may not be admitted directly into an Honours program except on the recommendation of the department or committee concerned. Applicants should note that meeting the minimum requirements stated above does not guarantee admission to the B.Sc. programs. Students presenting OAC (or equivalent) averages lower than those stated above might be admissible on an individual basis after consideration of whether there are special circumstances which would permit their admission.

Admission with Advanced Standing

1. An in-course student wishing to enter an Honours program must apply to the Chair of the appropriate department or committee through the Registrarial Services office for the Faculty of Science.

2. For entry to an Honours program after the completion of First year, a student must have a GPA of 5.0 or better in the Honours subject(s), an overall GPA of 4.0 or better and the recommendation of the Honours department or committee. A student beginning the final 10.0 credits towards an Honours degree must present a GPA of 6.0 or better in the Honours subject(s), an overall GPA of 5.0 or better and the recommendation of the Honours department or committee. A student beginning the final 5.0 credits towards an Honours degree must present a GPA of 6.5 or better in the Honours subject or in each Honours subject and a GPA of 5.0 or better overall, as calculated for graduation.

3. Students applying for admission to Honours in Science at Carleton after having obtained a degree from Carleton or another university shall meet the same criteria as specified above.

4. No student may be admitted to Honours in Science without satisfying the requirements for entry to the corresponding Major program.

5. While the consent of the department or committee concerned is necessary for entry to an Honours program, the department cannot establish a standard of entrance based on a GPA which is higher than that established by the faculty as set out in the foregoing paragraphs. Students who consider that they meet the requirements for entry to an Honours program but who have not been accepted by any department may appeal to the Science Committee on Admission and Studies for review of the case. The Committee will report to the Science Faculty Board on all such appeals. It should be noted, however, that departmental capacities to accept all qualified Honours candidates may be limited by physical resources.

6. Students in the final year of a Major degree program wishing to be considered for entry to an Honours program must apply to the Office of Registrarial Services for the Faculty of Science to have their names withdrawn from the graduation list before March 1 of that year. If subsequently the student is not accepted for an Honours program, the student must reapply for graduation.

Bachelor of Science, Major Program

Normal Admission to First Year

1. The OSSD including six OACs with an average of 70 percent, or equivalent, including a core consisting of one OAC in calculus and at least two OACs chosen from algebra and geometry, biology, chemistry, and physics. In addition, an average of 70 percent or better is required in the core OACs. The grade offered in OAC calculus must be 60 percent or better. No more than one of the two remaining core courses may be offered with a grade below 60 percent. Applicants from outside the province of Ontario must present acceptable equivalent certificates generally required for admission to universities in their own provinces or countries; or

2. The successful completion of 5.0 credits approved for a Qualifying-University year Science program with a GPA of 7.0 or better including a core of 0.5 credit in calculus and 2.5 credits chosen from biology, chemistry, geology, physics or mathematics. In addition, a GPA of 7.0 or better is required in the three-credit core. The grade offered in calculus must be C- or better. No more than one of the two and one half remaining core credits may be offered with a grade below C-

Applicants should note that meeting the minimum requirements stated above does not guarantee admission to the B.Sc. programs.

Students presenting OAC (or equivalent) averages lower than those stated above might be admissible on an individual basis after consideration of whether there are special circumstances which would permit their admission.

Admission with Advanced Standing

1. To be admitted to Second year a student must have completed the equivalent of the First-year Science program with the required academic standing.

2. Applications for admission to the Third or subsequent years will be evaluated on their merits, and advanced standing granted for studies undertaken elsewhere when these are recognized as the equivalent of subjects offered at Carleton University.

Credits Obtained as a Special Student

Students not admitted to a degree program but taking courses at Carleton University as Special students may, on transfer to a Science degree Program on the credit system, receive credit for not more than 7.0 credits, 4.0 of which must meet the First-year promotion requirements.

Admission to Qualifying-University Year in Science

The OSSD. A 75 percent average must be presented on a minimum of 10 Advanced Level credits at the Grade 11 and Grade 12 level including Chemistry and Physics, and Mathematics at the Grade 12 level. (See Admission chart, p. 44.)

Accelerated Progress

Students registered in Qualifying-University year who successfully complete two years or 10.0 credits at the University with a B- or 70 percent average may have their programs assessed for the purpose of reducing the number of credits required to graduate. This reduction may be made for any student registered in the Faculty of Science who satisfies the promotion requirements for First-year Science within one academic year after admission to Qualifying-University year Science with a GPA of not less than 7.0 over credits taken and with the recommendation of a Major department or interdepartmental program committee.

Course Regulations

Definition

In the following regulations the terms "arts or social sciences courses" and "arts or social sciences electives" refer to all approved courses offered in the Faculty of Arts and Social Sciences and in the Faculty of Public Affairs and Management (see also the section under "Courses not acceptable as arts or social sciences Electives").

Course Load

During the Fall/Winter session, a student registered in at least 4.0 credits is considered to be a full-time student. A student registered in fewer than 4.0 credits is considered part-time. The normal maximum course load for a full-time student in the Faculty of Science, during the Fall/Winter session, is the equivalent of 5.0 credits.

Students may register for a maximum of 2.0 credits in the Summer session.

A student may exceed the normal course load in the Fall/Winter session only with the Registrar's permission, which may be granted if a C average is maintained overall and in the Major field, and if recommended by the Major department.

Qualifying-University Year in Science

A Qualifying-University year is offered for students who do not have the equivalent of the OSSD with six OACs. The program consists of the following 5.0 credits:

1. Mathematics 69.007 ★;
2. 2.5 credits selected from Chemistry 65.010, Physics 75.107 ★ and 75.108 ★, Biology 61.103 ★ and 61.104 ★, Geology 67.100 or 67.105,

Mathematics 69.017 ★;

3. 2.0 other credits selected from any of the foregoing subjects not already presented and from other courses approved for a Qualifying-University year Science program as follows:

Science: Biology 61.103 ★ and 61.104 ★, Chemistry 65.010, Geology 67.100 or 67.105, Physics 75.107 ★ and 75.108 ★, Mathematics 69.017 ★.

Arts or Social Sciences: Any arts or social sciences course for which the student has the required prerequisite.

Computer Science: Any Computer Science course for which the student has the required prerequisite except 95.101 ★.

Bachelor of Science, First Year

The First-year program leading to the degree of Bachelor of Science consists of 5.0 credits approved for a First-year Science program including:

(a) 2.0 experimental Science credits chosen from two different departments of Biology, Chemistry, Geology or Physics;

(b) 1.0 Science credit chosen from an approved third different experimental Science or approved credits in Mathematics or Computer Science;

(c) 2.0 additional credits chosen from Science (not 60.101 ★, 60.102 ★ or 60.201 ★), Mathematics, Arts and Social Sciences, Public Affairs and Management (except Interdisciplinary Social Sciences 03.300 ★), Computer Science (except Computer Science 95.101 ★) or Engineering.

In establishing their First-year program of courses, students should consult with the chair of their Major department, the director of the Institutes of Biochemistry or Environmental Science, the chair of the Integrated Science Studies Committee, or the chair of the appropriate interdepartmental committee. Students who have not yet selected a Major field should select those First-year courses that will give them a wide choice of fields for the Second year.

Courses Approved for a First-Year Science Program

Science Courses

Biochemistry

63.220 ★

Biology

61.103 ★, 61.104 ★

or if these courses have been completed prior to First year, with permission, any two of:

61.201 ★, 61.202 ★, 61.214 ★, 61.220 ★

Chemistry

65.010, 65.100; or if this course has been completed prior to First year, with permission: 65.211 ★, 65.212 ★, 65.223 ★, 65.224 ★, 65.226 ★, 65.227 ★, 65.228 ★, 65.232 ★, 65.233 ★ or 65.280 ★

Computer Science

95.102 ★, 95.104 ★, 95.105 ★, 95.106 ★, 95.107 ★, 95.108 ★

Geography

45.105

Geology

67.100, 67.105; or if one of Geology 67.100 or 67.105 has been completed prior to First year, with permission, any two of: 67.223 ★, 67.225 ★, 67.228 ★, 67.231 ★, 67.236 ★, 67.238 ★, 67.281 ★, 67.282 ★, 67.285 ★

Mathematics

69.017 ★, 69.107 ★, 69.117 ★, 69.102, 69.112, 69.207 ★, 69.217 ★, 69.241 ★, 69.257 ★ or any Mathematics course for which the student has the prerequisite.

Physics

75.101 ★, 75.102 ★, 75.107 ★, 75.108 ★; or if one of 75.101 ★ and 75.102 ★ or 75.107 ★ and 75.108 ★ has been completed prior to First year, with permission, any two of: 75.211 ★, 75.222 ★, 75.223 ★, 75.224 ★, 75.235 ★, 75.236 ★, 75.262 ★, 75.291 ★, 75.292 ★

Arts or social science courses

Any course available from the Faculty of Arts and Social Sciences or the Faculty of Public Affairs and Management with the exception of:

(a) courses as listed on this page. Advanced courses in certain disciplines may be included if the prerequisite has been completed prior to First year;

(b) any Computer Science course (including Interdisciplinary Social Sciences 03.300 ★);

(c) any course offered by the Departments, Schools or Institutes in the Faculty of Science and;

(d) any Engineering course.

Courses for Subsequent Years**Bachelor of Science Honours Program**

Students for a degree with Honours will ordinarily take at least 15.0 credits beyond the completion of First year. (See Honours admission requirements, p. 109 regarding transfers to the Faculty of Science from other institutions or faculties):

(a) at least 6.0 more credits in the Honours subject;

(b) at least 2.0 Science credits above the First-year level in a department or departments other than the Honours department;

(c) sufficient elective credits to meet the program requirements of 2.0 arts or social sciences elective credits and 1.0 free elective credit.

The course patterns for each Honours program are detailed individually, and requirements lie within the discretion of the appropriate department or committee. The student should therefore read the appropriate Calendar instructions and consult the chair of the appropriate department or committee. Capacities for Honours students will depend on departmental resources and the nature of the program.

Regulations governing Honours essays, theses or special projects are detailed in the departmental sections of this Calendar.

For course requirements for the Environmental Science Program see p. 238; for the Integrated Science Studies Program see p. 298.

Bachelor of Science Major Program

Candidates will ordinarily take at least 10.0 credits beyond the completion of First year:

(a) at least 4.0 more credits in the Major subject;

(b) at least 2.0 Science credits above the First-year level in a department or departments other than the Major department;

(c) sufficient electives to meet the program requirement of 2.0 arts or social sciences elective credits and 1.0 free elective credit.

The program of each student is under the direct supervision of a full-time member of the department in which the student takes his or her Major. In several departments most of the more advanced courses will be given, in whole or in part, during the day only. Candidates are advised to consult their Major departments as early as possible to arrange their programs.

Science Continuation Courses

The courses allowed in a Bachelor of Science program as Science Continuation courses are as follows:

1. All courses offered in the Faculty of Science beyond First year except Science 60.201 ★, 60.202 ★, Biology 61.216 ★ and Geology 67.241 ★, 67.242 ★, 67.243 ★.

2. All courses offered in Computer Science except Computer Science 95.101 ★. A maximum of two half credits at the 100-level in Computer Science (excluding 95.101 ★ completely) may be used as Science Continuation course credits.

3. Technology, Society, Environment (TSE) 59.301 ★, 59.302 ★, 59.350 ★, 59.401 ★, 59.402 ★, 59.403 ★, 59.405 ★, 59.406 ★, 59.407 ★ with the exception that Biology Major and Honours students may use these courses only as free electives. Integrated Science Studies students may take these courses as part of their program but may not count them as part of their science sequence.

4. Geography 45.207 ★, 45.302 ★, 45.303 ★, 45.305 ★, 45.306 ★, 45.307 ★, 45.311 ★, 45.312 ★, 45.313 ★, 45.315 ★, 45.318 ★, 45.319 ★, 45.400 ★, 45.402 ★, 45.403 ★, 45.405 ★, 45.406 ★, 45.408 ★, 45.411 ★, 45.413 ★, 45.414 ★, 45.417 ★, 45.418 ★.

5. Psychology 49.200, 49.220 ★, 49.270 ★, 49.300, 49.320, 49.321 ★, 49.322 ★, 49.323 ★, 49.324 ★, 49.325 ★, 49.326 ★, 49.327 ★, 49.356 ★, 49.370, 49.372 ★, 49.380, 49.401 ★.

6. All courses offered in the Bachelor of Engineering program beyond First year, subject to the approval of the Faculty of Engineering.

All Science Continuation courses taken outside the Major department must be approved by the student's Major department or committee. Courses counted in the Science sequence of the Integrated Science Studies Program will be determined and approved by the Integrated Science Studies Committee. Biology Major and Honours students should refer to Notes on Programs for special Science Continuation course provisions that apply to them.

Courses with Proscriptions

1. Science 60.101 ★, 60.102 ★ and 60.201 ★, Computer Science 95.101 ★ and Interdisciplinary Social Sciences 03.300 ★ are not acceptable for credit in the Faculty of Science. For students in programs offered by the School of Mathematics and Statistics, Mathematics 69.241 ★ is not acceptable for credit.

2. The following courses are acceptable only as free electives for Science students (except for students admitted to a program offered by the School of Mathematics and Statistics): Biology 61.192 ★, 61.193 ★, 61.216 ★, Chemistry 65.103 ★, Geology 67.104 ★, 67.241 ★, 67.242 ★, 67.243 ★, Mathematics 69.185 ★, Physics 75.190, Science 60.202 ★. In addition, Interdisciplinary Social Sciences 03.401 ★ and 03.402 ★ are acceptable only as free electives.

Courses not acceptable as arts or social science electives*Business*

42.101 ★, 42.102 ★, 42.104 ★, 42.105 ★, 42.142 ★, 42.201 ★, 42.202 ★, 42.230 ★, 42.270 ★, 42.301 ★, 42.308 ★, 42.400 ★, 42.401 ★, 42.402 ★.

Economics

43.220, 43.240 ★, 43.404 ★, 43.405 ★, 43.476 ★, 43.477 ★.

Geography

45.105, 45.207 ★, 45.302 ★, 45.303 ★, 45.305 ★, 45.306 ★, 45.307 ★, 45.311 ★, 45.312 ★, 45.313 ★, 45.315 ★, 45.318 ★, 45.319 ★, 45.400 ★, 45.402 ★, 45.403 ★, 45.405 ★, 45.406 ★, 45.408 ★, 45.411 ★, (Geology 67.415 ★), 45.413 ★ (Engineering 81.303 ★, Geology 67.419 ★), 45.414 ★, 45.417 ★ (Engineering 82.424 ★, Geology 67.424 ★), 45.418 ★.

Interdisciplinary Social Sciences

03.300 ★.

Psychology

49.200, 49.220 ★, 49.270 ★, 49.300, 49.320, 49.321 ★, 49.322 ★,

49.323★, 49.324★, 49.325★, 49.326★, 49.327★, 49.356★, 49.370, 49.372★, 49.380, 49.401★.

Sociology
53.370.

Academic Standing

Grading System

Standing in courses will be determined by departments and will be shown by alphabetical grades. (See p. 47.)

Standings to represent special circumstances are as follows:

Aeg

Pass standing granted although absent from final examinations. Aegrotat standing is granted only by the Science Committee on Admission and Studies in response to a student's application which meets the stipulations for examinations.

And

Indicates course is not being taken for academic credit.

Ch

Credit granted under Challenge for Credit policy.

F

Failure. No academic credit.

Wdn

Withdrawn in good standing. No academic credit.

Abs

Failure due to absence from the final examination where the necessary term work has been completed. No academic credit.

Def

Students who are absent from final examinations or who are unable to complete their course work for medical or compassionate reasons may apply to the Science Committee on Admission and Studies for deferred examination privileges.

IP

In Progress.

Promotion to the Credit System

Consideration for promotion to the credit system occurs within twelve months of admission to the program (for full-time students). After promotion to the credit system, the student is not again considered for promotion on an annual basis but accumulates course credits toward graduation requirements under an approved pattern. A student who is not promoted to the credit system fails First Year Science with consequences explained below.

Full-time Students

Full-time students in First-year Science, in order not to fail their year in May, must, by then, have passed at least 3.0 credits. Students who fail to meet this requirement must apply by June 30 for readmission to the Faculty of Science; students who fail First-year Science for a second time are not eligible to apply for readmission to the Faculty of Science.

To be promoted to the credit system from First year, a full-time Science student must have passed at least 4.0 credits including at least 3.0 credits in Science. The 3.0 credits in Science must include at least 1.0 credit in each of two different experimental Sciences. The remaining Science credit may be chosen from an approved different experimental Science or from approved credits in Mathematics or Computer Science. In addition, students must obtain grades of C- or better in at least 2.0 credits, including at least 1.0 credit in their intended Major.

For a student without advanced standing in any First-year courses, these 4.0 credits must be selected from those approved for a First-year Science program.

For a student (not repeating First year) with advanced standing in some First-year courses, these 4.0 credits must include sufficient courses to complete the First-year Science program; the remainder of the 4.0 credits may include courses beyond the First year provided the student has retained credit for the prerequisite First-year courses. In the Major program one of the grades of C- or better must be in the intended Major subject. In the Integrated Science Studies program, the student must have attained a grade of C- or better in 1.0 credit from each of the Science and Non-Science sequences.

This must be accomplished in one calendar year (12-month period) with not more than 2.0 credits of Summer courses. The course work of those First-year Science students who almost meet promotion requirements is reviewed by the Dean's Committee on Promotion.

A full-time student who does not meet the requirements of promotion by the end of August examinations will have failed First year.

Part-time Students

To be promoted to the credit system from First year, part-time students must, in the first 6.0 credits of final examinations, have passed at least 4.0 credits approved for a First-year Science program including at least 3.0 credits in Science. The 3.0 credits in Science must include at least 1.0 credit in each of two different experimental Sciences. The remaining Science credit may be chosen from an approved different experimental Science or approved courses in Mathematics or Computer Science. In addition, students must obtain grades of C- or better in at least 2.0 credits, including at least 1.0 credit in their intended Major. Part-time students who fail more than 2.0 full-credit equivalents in succession must apply for readmission to the Faculty of Science.

In the Major program, one of the grades of C- or better must be in the intended Major subject. In the Integrated Science Studies program, the student must have obtained a grade of C- or better in 1.0 credit from each of the Science and Non-Science sequences.

Consequences of Failure

Failed students within the limitations specified above may repeat First year, retaining credit toward their degree (but not toward the completion of First year) for all courses graded C- or better.

A student repeating First year may register only in courses approved for a First-year Science program, but may include 2.0 credits beyond the First year provided the student has retained credit for the prerequisite First-year course.

A student who fails First year a second time may not re-enter a degree program in the Faculty of Science.

Requirements for Honours Standing

For continuation in an Honours program, the student must maintain a GPA of 5.0 or better in the Honours subject(s), an overall GPA of 4.0 or better and be recommended by the Honours department or committee. A student beginning the final 10.0 credits towards an Honours degree must present a GPA of 6.0 or better in the Honours subject(s), an overall GPA of 5.0 or better and the recommendation of the Honours department or committee. At the beginning of their last 5.0 credits students must have:

- (a) a GPA of 6.5 or better in the Honours subject or in each Honours subject;
- (b) an overall GPA of 5.0 or better;
- (c) a grade of C- or better in at least half of the credits to be credited toward their degree;
- (d) the recommendation of their Honours department or committee. Otherwise the student may not remain in Honours;
- (e) students who have a GPA of 6.3 or 6.4 in their Honours subject may be allowed to continue at the discretion of the individual Department, Institute or Committee.

A student who fails to maintain Honours standing may not remain in Honours, and must discuss a new program with the chair of a department.

B.Sc. Combined Honours programs with Computer Science have a higher GPA requirement for continuation than that stated above. Please refer to the appropriate departmental section of this Calendar for further details.

The B.Sc. Co-op programs in the Departments of Biology, Chemistry, Earth Sciences (Geology), and Physics and the Institute of Biochemistry have a higher GPA requirement for continuation than that stated above. Please refer to the appropriate departmental section of this Calendar for further details.

Limits on the Number of Examinations

Honours degree students have the privilege of repeating or replacing courses subject to the following restriction: After admission to the credit system, the ratio of total number of (full-course equivalent) examinations to the total number of credits required may not exceed six to five. In particular, a student who requires 15 more credits has the equivalent of at most 18.0 full-credit examinations available to complete the program.

Major degree students have the privilege of repeating or replacing courses, subject to the following restriction: After admission to the credit system the ratio of total number of (full-course equivalent) examinations to the total number of credits required may not exceed three to two. In particular, a student who requires ten more credits has the equivalent of at most 15.0 full-credit examinations available to complete his or her program.

The number of examinations available to a student who transfers from another institution or from another program, will be determined on a pro rata basis and will be specified at the time of admission.

When a student is examined in a course that previously has been declared extra to the degree program, this examination does not affect the remaining number of available examinations.

Students who cannot complete their program without exceeding the available number of examinations forfeit their undergraduate status in the Faculty of Science.

Graduation

General Regulations

1. Every student will be required to complete the last 5.0 credits at Carleton University unless authorized by the Faculty of Science to take courses at the University of Ottawa under the Undergraduate Exchange Agreement.

2. A student who takes courses elsewhere with a Letter of Permission from the Science Committee on Admission and Studies may, with the approval of the appropriate department, school or institute or committee, use the credit value but not the grades to meet graduation requirements;

3. Students who transfer to the Faculty of Science from another institution must include in the courses presented for graduation (whether obtained at Carleton or elsewhere) at least:

(a) 2.0 credits of Arts or Social Sciences electives if on transfer they received credit for fewer than ten credits;

(b) 1.0 credit of Arts or Social Sciences electives if on transfer they received credit for 10.0 or more credits.

Note: See also University graduation regulations, p. 48.

Honours Degree Students

To qualify for graduation with a Bachelor of Science degree with Honours a student must:

1. present credits for at least 20.0 credits of approved full credits (or equivalent) beyond Qualifying-University year, with not more than 2.0 credits below the 100-level and not more than 7.0 below the 200-level;
2. meet the requirements of the Faculty of Science and of the appropriate department, institute or committee with respect to both course and grade requirements;
3. after entry to the credit system, have completed the program with not more than 6.0 (full credit equivalent) examinations for every 5.0 credits required. (Examinations include course repetitions and replacements.) A part-time student or a full-time student who has interrupted his or her studies must complete the program within seven years after entry to courses beyond First year;
4. include at least 2.0 credits in the Honours subject or subjects in the last 5.0 credits taken;
5. be recommended by the appropriate department, institute or committee and the Science Faculty Board.

The Honours degree will not be awarded to students taking fewer than 5.0 credits at Carleton.

Designations of B.Sc. (Honours) Degrees

Three designations of Honours are awarded, determined on the basis of the GPA as follows:

Highest Honours
10.0 — 12.0 in Honours subject, and
8.0 or better overall

High Honours
9.0 or better in Honours subject, and
7.0 or better overall

Honours
6.5 or better in Honours subject, and
5.0 or better overall

Departments or Institutes may recommend the higher designation of Honours degree in the case of a student one of whose indices is in the appropriate higher range and the other within 0.2 grade points of the higher range.

To determine the class of degree for students with Combined Honours, the average is computed on the basis of the weighted average of the required number of Honours credits in the two subjects. If agreeable to the committee concerned, the average may be taken in each of the two subjects and the simple average of the two may be used.

Departments or Institutes may use discretion for establishing the class of degree in counting the number of Honours credits where students have more than the minimum number of credits.

Environmental Science Degree students should see p. 238

Integrated Science Studies Degree students should see p. 298

Major Degree Students

To qualify for graduation students must:

1. present credits for 15.0 approved full courses (or equivalent) beyond Qualifying-University year with not more than 2.0 credits below the 100-level and not more than 7.0 below the 200-level;
2. have a grade of C- or better in at least half of the 15.0 credits;
3. have an average of C- or better in the credits in their Major subject or subjects;

Science

4. after entry to the credit system, have completed the program with not more than three (full-course equivalent) examinations for every 2.0 credits required. (Examinations include course repetitions and replacements.) Part-time students or full-time students who have interrupted their studies must complete the program within seven years after entry to courses beyond First year;

5. include at least 2.0 credits in the Major subject or subjects in the last 5.0 credits taken for credit;

6. be recommended by the Major department or institute and the Science Faculty Board.

To meet the requirements for the C- average in the Major stated above, only those credits in the Major necessary to make up the required total for graduation in the Major department or institute need be counted. All obligatory courses must be counted.

Designation of B.Sc. Majors Degrees

Graduating students in a Major program of the Faculty of Science will be designated as graduating "with Distinction" if:

1. they have no course failures, course repetitions or course replacements on their Carleton record after promotion to the course-credit system;

2. they have achieved an overall GPA of 8.0 or better calculated on their Carleton record, including all credits extra to the degree;

3. they have successfully completed at Carleton at least 10.0 credits counted toward the degree;

4. after promotion to the course-credit system, they have achieved a GPA of 9.5 or better calculated on all Carleton credits being counted toward the degree.

Academic Programs, Units and Courses

- Architecture
- Art and Culture: Art History, Film Studies, Music
- Art History
- Biochemistry
- Biology
- Biotechnology
- Business
- Canadian Studies
- Chemistry
- Child Studies
- Civil and Environmental Engineering
- Classics
- Cognitive Science
- Comparative Literary Studies
- Computational Sciences
- Computer Science
- Criminology and Criminal Justice
- Directed Interdisciplinary Studies
- Earth Sciences
- Economics
- Electronics
- English Language and Literature
- Environmental Science
- Environmental Studies
- European and Russian Studies
- Film Studies
- French
- Geography
- German
- History
- Human Rights
- Humanities
- Industrial Design
- Integrated Science Studies
- Interdisciplinary Studies
- International Affairs
- Italian
- Journalism and Communication
- Languages, Literatures and Comparative Literary Studies: Classics, German, Italian, Russian, Spanish, Comparative Literary Studies
- Law
- Law Enforcement Studies
- Linguistics and Applied Language Studies
- Mass Communication
- Mathematics and Statistics
- Mechanical and Aerospace Engineering
- Music
- Philosophy
- Physics
- Political Science
- Psychology
- Public Administration
- Public Affairs and Policy Management
- Religion
- Russian
- Social Work
- Sociology and Anthropology
- Spanish
- Systems and Computer Engineering
- Technology, Society, Environment Studies
- Women's Studies

Architecture

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Associate Professors

J. Barry Bell, B.E.S., B. Arch. (Waterloo), M.Phil. (Cambridge) • **Martin Bressani**, B.Sc., M.Arch. (McGill), M.Sc. (Massachusetts Institute of Technology), Docteur de l'université de Paris-Sorbonne • **Tom Dubicanac**, B.Arch., M.Arch. (Detroit) • **Benjamin Gianni**, B.A. (Pennsylvania), M.Arch. (Yale) • **Charles C. Gordon**, B.A. (Amherst) Ph.D. (North Carolina) • **Gilbert F. Sutton**, B.Arch. (Toronto), M.R.A.I.C., M.E.S. (York)

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Adjunct Research Professors

J. Archer • **H. Cameron** • **J. Cook** • **B. Firestone** • **S. Grossmann-Hensel** • **B. Hobin** • **L. Medek** • **A. Rankin**

Adjunct Professors

F. Carter • **N. Griffiths** • **E. Kayari** • **G. Milne** • **P. Sharp** • **J. Strutt**

Sessional Lecturers

S. Boyle • **J. Cook** • **T. Dallett** • **B. Eames** • **B. Firestone** • **L. Frankel** • **G. Fulton** • **Y. Gosselin** • **H. Roseman** • **J. Grant-Henley** • **G. Hartley** • **N. Holtz** • **J. Mountain** • **J. Sack** • **J. Salinas** • **N. Semanyk** • **J. Smith** • **B. Steele** • **K. Thorslund** • **T. Wolstenholme**

Photographic Supervisor/Instructor

D. Lepage

Bachelor of Architectural Studies Degree Program

The Bachelor of Architectural Studies degree is awarded on the successful completion of a four-year program of studies. Candidates should note that undergraduate studies are normally followed by professional studies at the graduate level. Like the profession of Architecture, the educational program can be rigorous in its dual demands of academic production and design creativity. It is recommended that full-time students do not engage in employment during the Fall/Winter session.

The curriculum at Carleton provides the student with the theoretical, technical, and formal knowledge and skills necessary for creative and responsible intervention in the built environment. In order to investigate and generate project proposals, the architect should be endowed with a range of sensibilities that emerge as synthetic vision in the design studio. The program has two components relating to this: a mandatory core that provides the essential knowledge and experience; and a series of elective courses, becoming more extensive in the upper years, that allow students to develop their own areas of architectural interest.

The Bachelor of Architectural Studies degree has been designed so that the degree, in tandem with a two year program (M.Arch. "Professional" Stream), is considered equivalent to Carleton's previous undergraduate architecture program (B.Arch.) by the Canadian Architectural Certification Board as a prerequisite to certification and registration to practise as an architect in provincial associations - subject to assessment of each applicant's record. Information concerning mandatory work experience and other requirements for registration may be obtained from the professional associations of the provinces of Canada.

The resources of the Ottawa area, including those of Carleton University, are unique in their concentration of specialized personnel, laboratories, libraries, and other facilities. They provide the opportunity and capability for a wide range of multidisciplinary academic and research programs in such fields as architecture, housing, urban studies, industrialized building, and the history and theory of architecture.

Thematic Major B.A.(Honours) and B.A. Degrees in History and Theory of Architecture

The School of Architecture cooperates with the School for Studies in Art and Culture in offering a Thematic Major B.A.(Honours) and B.A. degrees in History and Theory of Architecture.

Academic Clubs and Societies

The School of Architecture Association of Students (SAAS) organizes special events several times a year, and is a focus for student discussion.

Instructional Television

Instructional Television offers an alternative mode of access to courses offered at Carleton University. Your learning experience at Carleton University may include a mix of on-campus and television courses. For detailed information about itv refer to p. 57.

Program Requirements

In 1998-99, the School introduced a revised curriculum to address ongoing changes in the practice of Architecture. Students who en-

tered First Year of the program in 1998-99 or later will be registered in the Bachelor of Architectural Studies (non-professional) degree program and are subject to the revised Program Requirements below. Upon completion of the B.A.S. program, students wishing to obtain a professional degree would apply to continue into a two-year professional Master of Architecture program.

Students who entered First Year prior to 1998-99, or students who transferred into Third Year or above of the Architecture program in 1999-2000 will be registered in the B.Arch. degree program and are subject to the old Program Requirements as listed in the 1997-98 Undergraduate Calendar. (Copies are available from the School's Office.)

Regulations

The following regulations apply to all students enrolled in the School. Students are urged to seek the advice of their instructors on all questions about the regulations, and in particular before taking any action affecting promotion and probation, withdrawal, transfer of credit, appeals and review of grades.

The undergraduate Architecture program was revised in 1992 and again in 1998. Students admitted in 1998 or later follow the program as it appears in this Calendar. Students admitted prior to 1998 will normally follow the Calendar of the date of their entry into the program.

Student Responsibility

The student is responsible for knowing the regulations of the School of Architecture and for complying with them. Any exceptions to the regulations must be approved in writing by the School of Architecture Committee on Standing, Promotion and Awards (CSPA).

Exceptions to the Regulations

Regulations may be waived for academic, medical or compassionate reasons. The CSPA is responsible to the Architecture Faculty Board for considering students' requests for special consideration regarding the regulations. Requests should be made in writing to the Chair of that committee.

Admission and Readmission Requirements

First Year

To be eligible for admission to the First year of the Bachelor of Architectural Studies program, the applicant must have the OSSD or equivalent with six OAC's, including Physics and either Calculus or Algebra/Geometry with an average of 65 percent or better or have completed the Qualifying-University year at Carleton University with a GPA of 4.0 completed over 5.0 credits and grades of C- or better in Mathematics and Physics.

Refer to the section on Admissions in the general regulations of the Calendar for additional admission information.

Selective Admission

It should be noted that the number of student spaces in the School is limited. Because of this, it may not be possible to grant admission to all applicants who meet the foregoing requirements. Admission will therefore be on a selective basis with preference given to those candidates who show the highest promise of success in the program through a portfolio of creative work, and academic grades. Members of the Admissions Committee of the School of Architecture are available by appointment during the academic year to answer enquiries regarding the School's program.

Advanced Standing

Applications for admission with advanced standing to the First or

subsequent years of the Bachelor of Architectural Studies program will be evaluated on an individual basis. Before students apply they should note that although the School may accept previous course work for credit, there is no guarantee that a registration committee such as the Canadian Architectural Certification Board will do so as credit toward professional registration. Advanced standing for academic subjects completed at Carleton or at another university or college may be accepted where a grade of C- or better has been achieved if the courses are recognized as the equivalent of corresponding courses offered at Carleton. Advanced standing will only be recognized upon admission to the School. Applications for advanced standing must be processed before the session deadline for course changes in the term in which the student is first enrolled.

Readmission

Students who have been absent from the University for two consecutive Fall/Winter sessions and the intervening Summer session (except students holding a Letter of Permission from the Carleton School of Architecture) are required to apply for readmission before registration.

Former students who have forfeited their undergraduate status must request readmission by writing to the Director of the school and the request must be accompanied by an updated portfolio of work. The decision whether or not to readmit will be made by the Faculty Board. If readmitted, the student will return on probation.

Applications for readmission (obtainable from the Office of Admissions) must be filed before May 1 for the Fall/Winter session.

Proficiency in English

Since the instructional language of the University is English, applicants must be able to understand and be understood in English, both written and oral. Applicants whose mother tongue is other than English must clearly exhibit this ability. (See p. 31.)

Registration

Registration

In order to facilitate more effective academic planning for the following school year, students are asked to declare their intention not to continue in the program by July 1.

Students who have been absent from the University for one full Fall/Winter session (September through April) should notify the School by July 1 of their intention to register for the following Fall/Winter session.

Students are to complete their course registration by the registration periods shown for the session or term in the schedule for the Academic Year on p. 12.

Late Registration

Registration after the registration period incurs a late registration fee. Registration is not permitted after the late registration period.

Course Credit Value

Credit values are indicated against course descriptions. Courses marked ★ are half-credits, indicated 0.5 on record documents.

Course Load

The program in the School of Architecture is based on an annual course load of 5.0 credits for four years.

Student Records

Incorrect address information will delay the receipt of awards, examination results and changes in academic status. Students must

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notify the School and the Divisional Registrar's Office immediately of any change in permanent address.

Promotion and Continuation

Standing in Courses

Standing in courses will be determined by the School of Architecture. Standing in courses will be shown by alphabetical grades. (see p. 47).

Other notations are as follows:

Aeg

Pass standing granted under special circumstances. Aegrotat standing is granted only by a faculty committee, in response to a student's application. (See Deferred Final Examinations, p. 48.)

Aud

Indicates course is not being taken for academic credit.

F

Failure. No academic credit.

Abs

Absent from final examination. No academic credit. Abs is usually equated to failure.

Wdn

Withdrawn in good standing. No academic credit.

Def

Indicates that deferral of final grade has been approved by the CSPA. If the Deferred examination is not written, or if the incomplete work is not submitted by the scheduled date, the Def will be replaced by a grade based on the work completed prior to the granting of the deferral. (See also Deferred Final Examinations, p. 48.)

Ch

Credit granted under Challenge for Credit policy.

Computation of Averages

The 12-grade-point system is set out on p. 47.

GPA's are calculated by dividing the total accumulated grade points by the total credits.

Promotion decisions are based only on courses taken while the student is registered in the Bachelor of Architectural Studies program.

Promotion

Students who achieve the necessary cumulative GPA will be promoted to the next year of the program. In arriving at the cumulative GPA, all grades achieved while registered in the Bachelor of Architectural Studies degree program are averaged.

Design Studio Courses

In each Design Studio course, a grade of C- or better is required for the student to be eligible for promotion. Students who, during one year of the program, achieve a passing mark in the Design Studio courses in one term and a D+, D, or D- in the other, and whose GPA in studio is 3.5 or better may apply to the School for a discretionary decision on promotion. These applications must be made prior to June 1. Students must submit their studio portfolio for review by faculty members teaching in that year. In these cases, a discretionary decision will be made to promote or to prescribe further study before promotion. The student will be informed of this decision by the School.

All Other Courses

In the combined courses without design studio, a GPA of 3.5 or better is required, to be promoted to the next year of the program.

Design Studio Course Sequence

In the first and second year of the program, studio must be taken in sequence. In the third and fourth year studios may be taken out of sequence with the permission of the CSPA.

Deficiencies

Students who are not on probation and who have not more than 1.0 credit deficiency may proceed to the next program year. Students with more than 1.0 credit deficiency are not permitted to register in core courses in the next program year.

Core course deficiencies may not be carried for two program years except with the written permission of the CSPA.

A Design Studio course that has been graded lower than C- must be repeated unless a discretionary decision for promotion has been granted. Students will not advance to the next higher program year until the Design Studio course has been successfully completed; however, students may register in non-studio courses in the next higher program year. Students may repeat a studio course only once; failure to obtain the required grade will result in students being required to withdraw from the program.

Withdrawal from the Program

Students who have successfully repeated a studio course, but who receive a grade lower than C- in a subsequent studio course, will be required to withdraw from the program. Students who have been required to withdraw from the program must wait for at least one academic year before applying for readmission to the program. If readmitted, such students will be placed on probation.

Probation

Students must maintain a cumulative GPA of 3.5 or better in non-studio courses to remain in good standing. In order to be eligible for promotion to the next higher program year, students must also obtain a grade of C- or better in each studio or have received a discretionary promotion.

Students whose GPA in non-studio courses falls below 3.5 may proceed to the next higher program year on probation. Students have a maximum of one academic year to clear probation.

In order to return to regular status, students on probation must repeat and pass each failed course (except for electives, where a substitute course may be taken) and must, during the next academic year, raise their cumulative GPA in non-studio courses to 3.5 or better. If the required GPA is not achieved, the student will be required to withdraw from the program.

Students may repeat a failed course only once for the purpose of clearing probation.

Students who have cleared probation in the past, but whose grades in the subsequent year would lead to a second probation will be required to withdraw from the program.

Students who have been placed on probation, and who have either previously received or subsequently receive a grade lower than C- in a studio course will be required to withdraw from the program.

Students who have been required to withdraw from the program must spend at least one academic year away from the program before applying for readmission. If readmitted, the student will return on probation.

Examinations

General regulations on examinations are on p. 48.

Review of Grades

Students are entitled to a review of a final grade. Those wishing to receive such a review should enquire at the Registrarial Services office for the Faculty of Engineering and Design, after which they may wish to make a formal application for this review. Applications must be filed with the Registrarial Services office for the Faculty of Engineering and Design according to the application deadlines for each term.

Requests for review of grades in Architecture courses are dealt with by the Director of the School of Architecture. Students will be invited to submit to the Director a written statement presenting the grounds for the Review and their work from the course. This must be received in the Director's Office no later than: February 15th for the Fall term; July 15th for the Winter term; and October 15th for the Summer session. The instructor(s) who awarded the grade will present the rationale for the grade awarded. A Review of Grade Committee will be established by the Director, comprised of faculty from the School who are not directly involved with the grade under review. The Committee shall make recommendations to the Director, with respect to the grading. Changes in grade shall be at the discretion of the Director.

The Review of Grade Committee will be established after the deadline for applications has expired.

Evaluation

To gain standing in a course, a student must meet the course requirements for attendance, term work and examinations. Instructors will inform their classes in writing, before the last date for course changes, of the elements that will contribute to the final grade and their weighting, including attendance, class participation, essays, tests and final examinations.

Retention of Work

Keeping a good portfolio is a most important part of architectural education. A portfolio represents a record of the student's progress and design experience over the years. It is an indispensable requirement for any job application in the future. A portfolio is started in First year and continues to expand until graduation. The School, therefore, requires that each student produce reductions (normally 8 1/2 x 11 inch reproductions, colour or black and white and/or slides) of their work at the end of each term. One copy of the work should be put in the student's portfolio and the other turned in to the instructor for retention in the School's archives. (This facilitates retrospective exhibitions of work, accreditation, publications and any future references for pedagogic purposes.) Original work is the property of the students, but the School retains the right to keep work of merit for up to two years after the date of submission. The School will make every effort to preserve the work in good condition, and will give authorship credit and take care of its proper use.

Graduation Regulations

In order to graduate, students must fulfill all University graduation regulations (see p. 48.). To meet Section 1 of the School's regulations, a student must have passed the approved pattern of courses and achieved the minimum grade requirements for the Studio program and a GPA of 3.5 or better in non-studio courses.

Students wishing to continue into the professional M.Arch. degree program must have successfully completed the B.A.S. degree program with a GPA of 7.0 or better.

Application to Graduate

Students expecting to graduate in the Spring must make application on the form available in the Divisional Registrar's office by February 1; those expecting to graduate in the Fall by September 1; and those expecting to graduate in February, by December 1.

Degrees with Distinction

Upon recommendation of the School, the notation "With High Distinction" may be made on the academic records of candidates for the degree of Bachelor of Architectural Studies. To be considered for this recommendation, candidates must obtain an overall GPA of 10.0 or better.

Upon recommendation of the School, the notation "With Distinction" may be made on the academic records of candidates for the degree of Bachelor of Architectural Studies. To be considered for this recommendation, candidates must obtain an overall GPA of 9.0 or better.

For transfer students, degrees "With Distinction" and "With High Distinction" will be awarded at the discretion of the Faculty Board.

Scholarships and Awards

The faculty of the School will recommend students to the Senate for scholarships and awards available to the School. For this purpose an overall GPA including the design studio courses will be calculated. The design studio grade, the course GPA or the overall GPA will be used as is most appropriate for the nature of the award.

Special prizes are also given to acknowledge distinguished work.

Students admitted with advanced standing whose GPA may not represent a true measure of their worth will be given individual consideration.

See Awards and Financial Assistance, p. 470.

Course Requirements

Core Courses

1. Design Studios

The heart of the architectural program is the design studio. Design projects are the primary learning vehicle, supported by lectures, seminars, and tutorials. The most valuable aspect of the Studio program is its emphasis on creative architectural thinking driven by conditions and by issues embedded in the life experiences of individuals. Individual sensibilities, however, must be integrated with site and environmental conditions, human factors, building technologies, the architect's professional obligations to society, and with the conventions of architectural practice. The essence of the design studio is the resolution of these often conflicting demands.

Design Studio courses are 1.0 credit in the First year and 1.5 credits per term in the Second, Third and Fourth years. Design Studio courses are taught through lectures, seminars, and individual tutorial instruction. They require more individual work than is indicated by the scheduled contact time. Enrollment is restricted to students admitted to the Architecture program.

Studio Critiques are indispensable, and integral to nearly all architectural programs. Critiques are the form in which discussions of architecture become concrete and specific, around work actually completed. They provide an opportunity for students to explain intentions and to judge intentions against the interpretations of guests, faculty, and other students.

Summer Studio

A Design Studio course may be offered during the summer session. This studio is available to full-time students registered in the B.A.S. degree program. It is not available to First-year students seeking Second-year credit. Summer Studio may not be audited.

2. Core Courses

Core courses are the mandatory part of the program, providing the required academic and professional foundation for studies in archi-

ecture. While more extensive in the lower years, they extend across the entire program and are as designated in the course charts, p. 130 and in the description of courses offered, p. 131. Enrollment in core courses may be limited by constraints of space and other resources. When necessary, preference will be given to students registering in the Architecture program and the Architecture/Art History combined program.

Note: Prerequisites to core courses may not be waived except on appeal to the CSPA and with special permission of the Faculty Board.

3. Elective Courses

Elective courses fall under two categories: "Free Electives" (which may be chosen from among courses offered for credit within degree programs in the University, including undesignated elective offerings in the School), and "Designated Electives" (chosen from among designated offerings in the School). Designated electives fall into two categories: Workshops and Theory/History Electives.

To satisfy Free Elective requirements in the Bachelor of Architectural Studies program, the School will recognize any successfully-completed university-level course considered acceptable by Carleton University. Free Electives are noted as "electives" in the charts on page 121.

Designated Electives

1. Workshops

Workshop courses are offered through the School of Architecture. They are scheduled for six hours a week, divided between seminars and individual work, including tutoring. Workshop enrollments are limited. Students may take up to 1.0 credit of Workshops in their Third and Fourth years.

2. Theory/History Electives

Theory/History Electives are offered through the School of Architecture. They are intended to develop a broad, historical understanding of theoretical issues and debates in the making of architecture. A minimum of 1.5 credits of Theory/History Electives are required.

In addition to the Theory/History electives included among the Architecture course offerings, the following courses will be accepted:

Art History

11.302 ★ Canadian Architecture

11.305 ★ American Architecture

11.369 ★ Modern Architecture: The Twentieth Century

11.480 ★ Topics in Architectural History

A minimum of three Theory/History Electives are required.

Course Program

The program of study is outlined in the following charts and detailed course descriptions appear on p. 121, and listed under "Courses and Workshops."

All programs are subject to change according to the final availability of resources at the time of registration.

Student Initiated Study Abroad

Applications for Student Initiated Study Abroad programs (which include studio courses) will be considered for credit on a case by case basis by the CSPA. Students must present full, comprehensive, and detailed information (in English) for the courses and program proposed. The deadline for applications is February 1. In order to be eligible to take design studio courses students must have completed the previous program year with clear standing and have

achieved a cumulative GPA of 7.0 or better in all studio courses previously taken at Carleton. Students wishing to study abroad in their Fourth year should participate in the School's Directed Studies Abroad programs. Students who are accepted into Student Initiated Studies Abroad programs must obtain a letter of permission from the CSPA before registering at the host institution.

Directed Studies Abroad

When circumstances allow, the School will undertake a Directed Studies Abroad option for groups of 15 or more students who are enrolled in the Fall term of the Fourth or Fifth year of the program. The School may support the proposal for a Directed Studies Abroad program, but if the participation list falls to a group of fewer than 12 students, the School will cancel the program. Notification of such program cancellation will be made as soon as possible after the decision has been taken.

This study takes place in a location away from Ottawa and usually outside Canada. The location is selected for its architectural and urban relevance, and is carried out under the direction of a faculty member of the School.

The Directed Studies Abroad option is available to students with clear standing to the Fourth year of the program and permission of the School. Academic standing will be determined on the basis of the grades achieved by the end of the examination period of the Winter term of Third year. Participation lists, including wait lists, for all Directed Study Abroad programs will be determined according to the standing that students have achieved at that date, irrespective of work, they may choose to undertake over the Summer session. Those who achieve clear standing after the Winter term deadline will be accommodated, with the permission of the School, where space is available.

Independent Study

A student enrolled in the Bachelor of Architectural Studies program may propose, and may be permitted to undertake, an independent study in lieu of an elective or workshop elective course for a total of 0.5 credit.

The purpose of this provision is to allow more flexibility for students to pursue a line of investigation in their own way, free of normal constraints of timetable and University locale. The independent study at the undergraduate level is to make no demands on University faculty other than those required for approval and evaluation.

In certain cases, with the approval of the department in which they are registered, students enrolled in another program at the University may be permitted to enroll in an independent study course under the direction of a member of the faculty of the School. The procedures and conditions will be detailed and approved jointly by the student, the department and the assessor in the school.

Serious scholarship and research are expected and proper documentation will be required. In the case of students in Architecture, registration for the study will be subject to the following conditions:

1. The student must not be on probation and must have no deficiencies in core courses from an earlier year.
2. The student will register for an independent study course in the term or session during which the work is to be completed. The student must submit the proposal in writing to the assessor prior to registration, outlining the objectives and direction of the study, the time and locale, resources available, submission date and other pertinent information.
3. The student must have obtained the prior agreement of a member of the teaching staff to act as assessor for the study. The stu-

dent must also obtain the Director's approval of the proposal prior to registering in the course. The staff member will be responsible for evaluation. The student's assessor will deliver the completed and approved proposal to the Records office of the School of Architecture to be filed with the student's course records.

General Information

Materials, Supplies and Field Trips

The program in Architecture, particularly the design studio courses, requires that the student produce large quantities of drawings and models, as well as ozalid prints and photostats, and requires use of other photographic media, reproductions of drawings, reports, etc., all of which can be costly.

Equipment for drawing, photography, etc. should be regarded as an investment, because good tools are essential and last a long time if properly cared for. An equipment list is provided as a guide to the entering student. A good quality 35mm. camera is a very useful but not mandatory item on the list and most students find they use it to such an extent that they wish to purchase one during the first year or two of the program.

Field trips to other cities are frequently a part of the program. While these field trips are intended to enhance the area of study, all trips are voluntary and are not considered to be mandatory to meet the requirements of the area of study.

Experience indicates that the student should budget about \$1,500 for materials, equipment and field trips per year, not including a camera.

B.A.S. Program

First Year	Fall Term	Winter Term	
11.110★	Western Art: Prehist to Medieval	11.111★	West Art: Ren to Pres
0.5 credit★	Elective	0.5 credit★	Elective
76.100★	Introduction to Architecture	82.105★	Intro to Technology
85.216★	Introduction to Multimedia	80.115	Studio 1
80.105★	Drawing		

Note: Architecture 80.115 has a course value of 1.0 credit.

Second Year	Fall Term	Winter Term	
79.215★ 77.222★	Computer Modeling & Form Anal Architectural Technology I	76.230★ 77.223★	Intro. to Modern Arch Architectural Tech 2
80.215	Studio 2	80.216	Studio 3

Note: Architecture 80.215 and 80.216 each have a course value of 1.5 credits.

Third Year	Fall Term	Winter Term	
0.5 credit ★ 77.322 ★	Theory/History Elective Architectural Technology 3	0.5 credit ★ 0.5 credit ★	Theory/History Elective Workshop or Elective
80.315	Studio 4	80.316	Studio 5

Note: Architecture 80.315 and 80.316 each have a course value of 1.5 credits.

Fourth Year	Fall Term	Winter Term	
0.5 credit ★	Elective	0.5 credit ★	Theory/History Elective
0.5 credit ★	Workshop or Elective	77.450 ★	Design Economics
80.415	Studio 6 (Possible DSA 1st semester)	80.416	Studio 7

Note: Architecture 80.415 and 80.416 each have a course value of 1.5 credits.

B. Arch. Program

The First and Second year program of the B.Arch. degree have been phased out. The B.Arch. program will be replaced by the B.A.S. program (see above).

Third Year		Fall Term		Winter Term	
76.410 ★	Physical Morphology of the City			77.301 ★	Light and Acoustics in Architecture
77.313 ★	Structural Design in Architecture			0.5 credit ★	Elective
0.5 credit ★	Workshop			0.5 credit ★	Workshop or Elective
80.304	Design Studio 3A			80.306	Design Studio 3B

Notes: 1. Architecture 80.304 and 80.306 each have a course value of 1.5 credits.

2. 77.301 ★ now replaces 77.206 ★ and 77.205 ★.

Fourth Year		Fall Term		Winter Term	
0.5 credit ★	Elective			76.452 ★	Architectural Research and Criticism
0.5 credit ★	Elective			0.5 credit ★	Elective
0.5 credit ★	Workshop			0.5 credit ★	Workshop
80.403	Design Studio 4A			80.405	Design Studio 4B

Note: 1. Architecture 80.403 and 80.405 each have a course value of 1.5 credits.

Fifth Year		Fall Term		Winter Term	
77.450 ★	Design Economics			78.420 ★	Professional Practice
One of:				One of:	
80.440	Studio 5A and 1.0 credit Elective or 0.5 credit			80.458	Studio 5B: Student Initiated Projects
	Elective and 0.5 credit Workshop			80.461	Research Thesis 2
80.460	Research Thesis 1			80.467	Design Thesis 2
80.466	Design Thesis 1				
80.470	Selected Topics Studio				

Notes: 1. Architecture 80.440 has a course value of 1.5 credits. Architecture 80.458, 80.460, 80.461, 80.466, 80.467, 80.470 each have a course value of 2.5 credits.

2. Students who have already taken Architecture 77.350 will take an approved elective as a substitute.

Courses and Workshops

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Theory/History

Architecture 76.100 ★

Introduction to Architecture

Architecture in the matrix of human conditions: linkages among architecture, fine arts, humanities, social sciences, physical sciences, mathematics and philosophy. Architectural ideas will be introduced through a discussion of cities, buildings and landscapes. (Core Course)

Lectures three hours a week.

First offered 1998-1999

Architecture 76.105 ★

Architectural Thought and Contemporary Society

The relationship of architecture, architectural thought and the architectural profession to the societies in which they exist (and which

they must serve). Topics are selected to emphasize key issues. (Elective Course)

Lectures and seminars, three hours a week.

Architecture 76.206 ★

Introduction to Industrial

Design An overview of the theoretical background of industrial design, consisting of such topics as: the definitions and dimensions of design and industrial design, its nature and its historical evolution; the notion of quality; quality aspects in man-made objects; formal qualities as determinants for categories of design; design methods; design management in industry; professional practice of industrial design and industrial design promotion, nationally and internationally. Practising industrial designers are invited to present case studies of their activities. (Elective Course) (Also listed as Industrial Design 85.100 ★.)

Lectures three hours a week.

Architecture 76.211 ★

Industrial Design Analysis

The various problems involved in industrial design are analyzed. Among others: the relationship with principal techniques and mass-production technology; problems of uniformity and variety, specialty and versatility in production; problems of tolerances; the

role of ergonomics and anthropometrics in design; industrial design and environment; speculations about future industrial design approaches with regard to pollution and conservation of resources; adaptation of value-analyses to the field of industrial design. (Elective Course) (Also listed as Industrial Design 85.101 ★.)

Prerequisite: Architecture 76.206 ★ or Industrial Design 85.100 ★.
Lectures three hours a week.

Architecture 76.230 ★

Introduction to Modern Architecture

Architectural and urban ideals of modernism with special emphasis upon the development of the avant-garde in the early twentieth century. The phenomenon of modern architecture within the broader framework of the development of western thought. (Core Course)

Precludes additional credit for Architecture 76.309 ★.

Prerequisites: Art History 11.110 ★ and 11.111 ★; or permission of the School.

Lectures three hours a week.

First offered 1999-2000.

Architecture 76.328 ★

The Architecture of Urban Space

Design explorations that are directed towards the search for aesthetic form and meaning in urban space, with particular application to the Canadian context. Project-oriented. (Workshop)

Prerequisite: Permission of the School.

Lecture, seminar, lab or field work six hours a week.

Architecture 76.392 ★

Selected Topics: Workshops in Theory and History of Architecture

Workshop focuses on one specific aspect of architecture in the area of theory and history. Workshop offerings change from year to year. (Workshop)

Prerequisite: Permission of the School.

Lecture, seminar, lab or field work six hours a week.

Architecture 76.402 ★

History of Canadian Architecture

Canadian architecture from the seventeenth century to the present day, covering both stylistic and technological developments. Building styles, methods, and materials in the context of social and economic conditions and construction techniques. (Theory/History Elective) (Also listed as Art History 11.302 ★)

Precludes additional credit for Architecture 76.302 ★.

Prerequisite: Architecture 76.230 ★ or permission of the School.

Lectures, seminars three hours a week.

Architecture 76.404 ★

History of Architectural Theory

An exploration of architectural intentions in the early period of Western history, with special emphasis on Renaissance treatises and ideas. Architectural intentions in relation to shifting world-views, as a basis of historical interpretation. (Theory/History Elective)

Precludes additional credit for Architecture 76.307 ★.

Prerequisite: Architecture 76.230 ★ or permission of the School.

Lectures three hours a week.

Architecture 76.406 ★

Origins of Modern Architecture

Exploration of architectural theories with special emphasis on the European context from the seventeenth century to the late nineteenth century. (Theory/History Elective)

Precludes additional credit for Architecture 76.308 ★.

Prerequisite: Architecture 76.230 ★ or permission of the School.

Lectures three hours a week.

Architecture 76.408 ★

Foundations of Modernism in Architecture

Major critical perspectives as applied to architecture as a fine art. The

debate between classicism and romanticism with consideration of its cultural roots. (Theory/History Elective)

Prerequisite: Architecture 76.230 ★ or permission of the School.

Lectures three hours a week.

Architecture 76.409 ★

History and Theory of the Avant-Garde

Exploration of architectural theories with special emphasis on the development of the Avant-Garde in the early twentieth century, looking at the Avant-Garde within the larger framework of modernism. (Theory/History Elective)

Precludes additional credit for Architecture 76.309 ★.

Prerequisite: Architecture 76.230 ★ or permission of the School.

Lectures three hours a week.

Architecture 76.410 ★

The Physical Morphology of the City

Description and comparative analysis of the physical morphology of cities. Primary structural, spatial and formal organization and elements that characterize the morphology of cities studied in terms of their historical and contemporary significance for architecture and urban design. (Core Course for B. Arch. students)

Precludes additional credit for Architecture 76.204 ★ and 76.310 ★.

Prerequisite: Architecture 76.106 ★, 76.110 ★ (11.120 ★), 76.220 ★ (11.121 ★) or permission of the School.

Lectures three hours a week.

Last offered 1999-2000.

Architecture 76.415 ★

Theories of Landscape Design

Introduction to landscape architecture as the organization of outdoor space. Historical, cultural, economic and political factors as a basis for interpreting spatial organization in urban and rural areas of human settlement. Emphasis on the period from the fifteenth to the nineteenth century. (Theory/History Elective)

Precludes additional credit for Architecture 76.315 ★.

Prerequisite: Architecture 76.230 ★ or permission of the School.

Lectures three hours a week.

Architecture 76.423 ★

Society and Shelter

Buildings and shelter as human and social products. Topics such as the perception and cognition of the built environment and its impact on social processes; the design, construction and use of buildings as social processes; the design professions; shelter and social stratification. (Theory/History Elective) (Also listed as Sociology-Anthropology 53.339 ★.)

Prerequisite: Architecture 76.230 ★ or permission of the School.

Lectures three hours, seminars three hours a week.

Architecture 76.424 ★

Studies in the Design Professions

Architecture and design professions in relation to traditional professions and to occupations in art and design. Professions in the development of culture and society; education, career and work; knowledge in the design professions; and the nature of design practice. (Elective Course) (Also listed as Sociology 53.424 ★)

Prerequisite: Third-year standing in the B.A.S. program; Fourth-year standing in Sociology; Fourth-year standing in the B.A. (Honours) Architecture/Art History program; or permission of the School.

Seminar three hours a week.

Architecture 76.425 ★

Workshop: User Analysis and Building Performance

Projects to develop skills in the analysis of building performance. Examination of occupancy analysis, safety and risk assessment, post-occupancy evaluation, and social impact assessment. (Workshop)

Prerequisite: Permission of the School.

Lecture, seminar, lab or field work six hours a week.

Architecture 76.430 ★

Neo-Classical and Nineteenth-Century Architecture

Eighteenth and nineteenth-century architecture and urban form in Western Europe. Emphasis on the cultural and philosophical framework of rising modernity to illuminate architectural production and theory as well as the development of urban form. (Theory/History Elective)

Precludes additional credit for Architecture 76.121 ★ and 76.220 ★. Prerequisite: Architecture 76.230 ★ or permission of the School. Lectures three hours a week.

Architecture 76.431 ★

Architecture in the Post-War Period

Architectural thought and practice in the post-avant-garde period in Western Europe and America in light of the development of the modern metropolis and its suburb. (Theory/History Elective) Prerequisite: Architecture 76.230 ★ or permission of the School. Lectures three hours a week.

Architecture 76.432 ★

Ancient and Pre-Columbian Architecture

Monumental temples of the ancient Mesoamericans are compared with other world traditions at similar levels of cultural development. Selected examples considered in terms of morphology, technology, iconography, social/political context, world view and general architectural theory. (Theory/History Elective)

Prerequisite: Architecture 76.230 ★ or permission of the School. Lectures three hours a week.

Architecture 76.433 ★

Greek Architecture

Architecture of Greek antiquity and its relationship to its philosophical, artistic, and mythical contexts. The development of the idea of the city; the presence of architecture within its symbolic landscape. (Theory/History Elective)

Prerequisite: Architecture 76.230 ★ or permission of the School. Lectures three hours a week.

Architecture 76.434 ★

The Architecture of Rome

Rome in its classical to late-antique periods. Its founding mythologies and landscape. In-depth analysis of Rome, with special attention to its public buildings. Early Christian architecture within the Roman context. (Theory/History Elective)

Prerequisite: Architecture 76.230 ★ or permission of the School. Lectures three hours a week.

Architecture 76.435 ★

Medieval Architecture

Gothic architecture, and its relation to its philosophic and artistic predecessors. Special attention to the coexistence of the monastic tradition, late romanesque building, and new experiments in gothic during this period, marked by intellectual and political ferment. (Theory/History Elective)

Prerequisite: Architecture 76.230 ★ or permission of the School. Lectures three hours a week.

Architecture 76.436 ★

Renaissance Architectural Theory

The rise of architectural theory within the context of the Italian Renaissance. Canonic texts explored and compared in the context of the architectural developments of the period. (Theory/History Elective)

Prerequisite: Architecture 76.230 ★ or permission of the School. Lectures three hours a week.

Architecture 76.437 ★

Architecture of the Muslim Cultures

Historical and theoretical discussions about the architecture of Muslim cultures. Selected sites and monuments from eighth to eighteenth century, covering the vast geography from North Africa

to South-east Asia. (Theory/History Elective)

Prerequisite: Architecture 76.230 ★ or permission of the School. Lectures three hours a week.

Architecture 76.438 ★

Asian Architecture

Anthropological history of the architecture of the Near- and Far-East. The architecture and urban form of Ancient Egypt, Anatolia, Sumer and Persia. The architecture and cities of Ancient China and India. (Theory/History Elective)

Prerequisite: Architecture 76.230 ★ or permission of the School. Lectures three hours a week.

Architecture 76.439 ★

Mesoamerican Architecture

Selected works of Mesoamerican architecture in terms of iconography, morphology, technology, function, historical development, and concept. Mesoamerican architectural features compared with other world traditions. Emphasis on design. (Theory/History Elective)

Prerequisite: Architecture 76.230 ★ or permission of the School. Lectures three hours a week.

Architecture 76.440 ★

Directed Studies Abroad: Theory

A survey of the architectural and urban history of a specific culture. These discussions address the present reality of a country, region or city being visited by the Fourth year of the program. (Elective Course)

Prerequisite: Clear standing to Fourth year and permission of the School.

Lectures three hours a week.

Architecture 76.452 ★

Architectural Research and Criticism

Preparation for the independent research and design work. Work related to the nature of research and criticism in architecture, with an emphasis on issues of current concern. (Core Course for B. Arch. students)

Lectures and seminars three hours a week.

Last offered 2000-2001.

Architecture 76.455 ★

Seminar in Theory and History

History and theory of architecture. Topics will vary from year to year. Limited enrollment. (Elective Course)

Prerequisite: Fourth-year standing in the B.A.S. or B.A. (Honours) Architecture/Art History programs, or permission of the School. Lectures three hours a week.

Architecture 76.481 ★

Selected Topics: Studies in Theory and History of Architecture

An aspect of architecture in the area of theory and history. Topics vary from year to year. (Theory/History Elective)

Prerequisite: Architecture 76.230 ★ or permission of the School. Lectures three hours a week.

Architecture 76.488 ★

Independent Study

(Elective Course)

Technical

Architecture 77.135 ★

The Nature and Behaviour of Materials

An introduction to organizational patterns, forms, and properties of materials such as cohesion, elasticity, strain energy, work of fracture, crack stopping, and the general theory of strength; a survey of the metallic and non-metallic traditions, plastics, composites, and materials of the future. (Elective Course)

Lectures three hours a week.

Architecture 77.201 ★

Structures in Architecture

A survey to structural planning, including a historical survey of structural systems, details and the study of the factors involved in the synthesis of a suitable structural scheme. The course is intended as a survey of the science and the structural properties of materials. (Elective Course)

Precludes additional credit for Architecture 77.113 ★.

Lectures three hours a week, laboratory is block scheduled.

Architecture 77.222 ★

Architectural Technology 1

Case studies of vernacular buildings from different climatic regions: issues of human comfort, construction, and materials. Site orientation, foundations, structure and envelope in terms of their response to local climate: sun (light and heat), wind, moisture. (Core Course)

Prerequisite: Civil Engineering 82.105 ★ or permission of the School.

Lectures three hours a week.

First offered 1999-2000.

Architecture 77.223 ★

Architectural Technology 2

Wood frame, post and beam and load bearing masonry construction. Implications of the structural system on building envelope, mechanical and electrical systems are explored. Emphasis on architectural detailing. (Core Course)

Prerequisite: Architecture 77.222 ★ or permission of the School.

Lectures three hours a week.

First offered 1999-2000.

Architecture 77.301 ★

Lighting/Acoustics in Architecture

Natural and artificial light, its sources and behaviour, visual perception, and impact design. Sound and the control of the sonic environment, including radiation, propagation, absorption, reflection, and noise control in building structures and spaces. (Core Course for B. Arch. students)

Precludes additional credit for Architecture 77.205 ★ and 77.206 ★.

Prerequisite: Architecture 77.221 ★ or permission of the School.

Lectures three hours a week.

Last offered 1999-2000.

Architecture 77.304 ★

Workshop: Energy and Form

Relationship between environmental factors, energy and architectural form. Explorations into ways in which buildings and building elements can be planned and designed to take advantage of natural cycles in order to minimize the need for supportive energy inputs. (Workshop)

Prerequisite: Permission of the School.

Lecture, seminar, lab or field work six hours a week.

Architecture 77.313 ★

Structural Design in Architecture

Behaviour of structural elements and simple systems under load conditions of increasing severity. Simplified design of structural elements and systems. Comparative estimation of stresses and deformations. Use of structural testing laboratory. (Core Course for B.Arch. students)

Prerequisites: Architecture 77.101 ★ and 77.213 ★.

Lectures three hours a week, laboratory one hour a week.

Last offered 1999-2000.

Architecture 77.314 ★

Matrix Analysis of Framed Structures

Review of basic structural concepts. Betti's law and applications. Matrix flexibility method; flexibility influence coefficients. Development of stiffness influence coefficients. Stiffness method of

analysis; beams; plane trusses and frames; space trusses and frames. Introduction to the finite element method. (Elective course) (Also listed as Engineering 82.420 ★).

Prerequisite: Engineering 82.323 ★.

Lectures three hours a week, problem analysis three hours alternate weeks.

Architecture 77.316 ★

Design of Structural Steel Components

Introduction to CAN/CSA-S16.1, design and behaviour concepts; shear lag, block shear, local plate buckling, lateral torsional buckling, instantaneous centre, inelastic strength and stability. Design of tension members, axially loaded columns, beams, beam-columns, simple bolted and welded connections. (Elective Course) (Also listed as Engineering 82.325 ★).

Prerequisites: Engineering 82.220 ★ and 82.324 ★.

Lectures three hours a week, problem analysis three hours alternate weeks.

Architecture 77.322 ★

Architectural Technology 3

Small to medium-scale steel and concrete structured buildings as case studies to explore different approaches to building envelope (curtain wall, rain screen wall, etc.), HVAC and lighting systems (exposed, concealed), interior planning (room acoustics, acoustic isolation, fire protection, finish materials etc.). (Core Course)

Prerequisite: Architecture 77.222 ★ or permission of the School.

Lectures three hours a week.

First offered 2000-2001.

Architecture 77.335 ★

Workshop: Materials Application

Application of building materials, including the forming of building parts and the design of joints for performance and assembly. Practical constructions using new technology are emphasized. (Workshop)

Prerequisite: Permission of the School.

Lecture, seminar, lab or field work six hours a week.

Architecture 77.392 ★

Selected Topics: Workshop in Architectural Technology

A specific aspect of architecture in the area of architectural technology. Offerings vary from year to year. (Workshop)

Prerequisite: Permission of the School.

Lecture, seminar, lab or field work six hours a week.

Architecture 77.406 ★

Mechanical and Electrical Services in Buildings

Human comfort, psychometrics, and a full range of building servicing systems including heating, ventilating, air-conditioning, plumbing, electrical systems, fire safety, vertical transport, energy conservation, recycling, site services, and the use of solar assisted systems for space/water heating and cooling. (Core Course for B.Arch. students)

Precludes additional credit for Architecture 77.305 ★ and 77.306 ★.

Prerequisite: Architecture 77.206 ★ or 77.301 ★; or permission of the School.

Lectures three hours a week.

Last offered 2000-2001.

Architecture 77.410 ★

Lighting for Architecture

A study of daylighting and electric lighting design techniques. Emphasis will be placed on day-lighting models and computer light-modelling software as tools to explore lighting design. (Elective Course)

Precludes additional credit for Architecture 77.300 ★.

Prerequisite: Architecture 77.223 ★ or permission of the School.

Lectures three hours a week.

Architecture

Architecture 77.412 ★

Acoustics in Architecture

Sound in enclosures, including interior design of auditoria and special applications. Sound reproduction and reinforcement systems. Acoustic privacy and protection, sound control in buildings, materials for noise control, community noise, industrial noise. Acoustic measurements and instrumentation. (Elective Course)
Precludes additional credit for Architecture 77.302 ★.
Lectures two hours, laboratory two hours a week.

Architecture 77.413 ★

Energy and Form

Energy as a criterion in decision-making for architectural design. Conventional energy resources and state-of-the-art alternative energy resource systems with respect to building shape, size, materials, openings, orientation, siting, and use. (Elective Course)
Precludes additional credit for Architecture 77.303 ★.
Lectures three hours a week.

Architecture 77.420 ★

Structural Morphology

Concepts and models bridging geometric morphology and architecture. Hierarchies of dimensional spaces. Planar and spatial orders. Form aggregation and space subdivision within the laws of geometric compatibility and formal rigidity. Size, similitude and isomorphism. (Elective Course)
Lectures three hours a week.

Architecture 77.422 ★

Wood Engineering

Introduction to structural design in timber. Properties, anatomy of wood, wood products, factors affecting strength and behaviour, strength evaluation and testing. Design of columns, beams and beam-columns. Design of trusses, frames, glulam structures, plywood components, formwork, foundations, connections and connectors. Inspection, maintenance and repair. (Elective Course) (Also listed as Engineering 82.422 ★)
Prerequisite: Fourth-year registration or permission of the School.
Lectures three hours a week, problem analysis three hours alternate weeks.

Architecture 77.428 ★

Workshop: Structure and Form

Study of structural nature of non-conventional space enclosure systems like cable structures, membranes, shells, submerged structures, excavated structural forms and lunar structures. (Workshop)
Prerequisite: Architecture 77.420 ★ or permission of the School.
Lecture, seminar, lab or field work six hours a week.

Architecture 77.430 ★

Performance of Building Materials

Materials available for building, with emphasis on their structure, properties, application and sustained performance over the life of a building. (Elective Course)
Precludes additional credit for Architecture 77.330 ★.
Laboratories, lectures, field trips four hours a week.

Architecture 77.440 ★

Design for Construction

Design in relation to materials and building construction including the effects of building codes, zoning bylaws, approvals, processes and legislation, the organization of the building industry, and cost estimating control. (Elective Course)
Prerequisite: Architecture 77.330 ★ or permission of the School.
Lectures, seminars, field work three hours a week.

Architecture 77.450 ★

Design Economics

Principles of building economics. Determinants of building costs and their prediction. Uncertainty and investment economics. Systems and techniques of creative cost control for buildings during

schematic design, design development, construction document preparation and construction. Economic evaluation during all phases of design process. (Core Course)
Precludes additional credit for Architecture 77.350 ★.
Prerequisite: Fifth-year standing or permission of the School.
Three hours a week.

Architecture 77.481 ★

Selected Topics: Studies in Architectural Technology

A specific aspect of architecture in the area of architectural technology. Topics vary from year to year. (Elective Course)
Prerequisite: Permission of the School.

Architecture 77.488 ★

Independent Study

(Elective Course)

Urban

Architecture 78.323 ★

Workshop: Landscape Architecture

Practical significance of landscape elements as they relate to built-form by integrating structure and site. (Workshop)
Prerequisite: Permission of the School.
Lecture, seminar, lab or field work six hours a week.

Architecture 78.345 ★

Workshop: Urban Design

Project-based workshop investigating current design attitudes and solutions affecting the physical morphology of cities. Formally sophisticated urban design projects. Various procedures and basic urban design ideas. (Workshop)
Prerequisite: Permission of the School.
Lecture, seminar, lab or field work six hours a week.

Architecture 78.349 ★

Workshop: City Organization and Planning Processes

Interdisciplinary investigation, analysis and synthesis of the institutions, processes, environments and demography of Canadian cities. Guest lecturers. (Workshop)
Prerequisite: Permission of the School.
Lecture, seminar, lab or field work six hours a week.

Architecture 78.392 ★

Selected Topics: Workshop in Urban Studies

A specific aspect of architecture in the area of urban studies. Topics vary from year to year. (Workshop) (Also listed as Business 42.481 ★)
Prerequisite: Permission of the School.
Lecture, seminar, lab or field work six hours a week.

Architecture 78.420 ★

Introduction to Professional Practice

The practice of architecture. Professional organization and conduct, the architect's services, business law, office organization and management, contract documents, building codes, contract management, cost control, accounting and site supervision. Guest speakers and case studies. (Core Course)
Precludes additional credit for Architecture 78.320 ★.
Prerequisite: Fifth-year standing or permission of the School.
Lectures three hours a week.

Architecture 78.440 ★

City Organization and Planning Processes

Structure, form and functioning of cities. Infra-structure, facilities and networks, ecosystems, demographic and social organization, government, quality of life, goals and perceptions, urban management, development, regulation and codes, design, planning and policy-making. (Elective Course)
Precludes additional credit for Architecture 78.340 ★.
Three hours a week.

Architecture 78.450 ★

The Development of Human Shelter

Background factors pertaining to housing in both industrial and Third-World countries; traditional and contemporary housing approaches; social housing; and people's right to adequate housing. Guest lecturers. (Elective Course)

Precludes additional credit for Architecture 78.350 ★.

Three hours a week.

Architecture 78.488 ★

Independent Study

(Elective Course)

Techniques

Architecture 79.215 ★

Computer Modelling and Form Analysis

Computer modelling as a medium of architectural analysis, documentation, and presentation. Principles and techniques of 2D drawing and 3D modelling. Extensive practical work using appropriate applications. (Core Course)

Precludes additional credit for Architecture 79.111 ★.

Prerequisite: Second-year B.A.S. standing or permission of the School.

Lectures three hours a week.

First offered 1999-2000.

Architecture 79.303 ★

Workshop: Theatre Production

Design and fabrication of theatre productions, one of which is staged on campus. Visiting directors, designers, technical consultants and others. Visits to theatres and production facilities. (Workshop)

Prerequisite: Permission of the School.

Lecture, seminar, lab or field work six hours a week.

Architecture 79.326 ★

Workshop: Computer Applications

Application of existing software and programming techniques to various architectural problems. (Workshop)

Prerequisite: Permission of the School.

Lecture, seminar, lab or field work six hours a week.

Architecture 79.332 ★

Workshop: The Anatomy of Architecture

The architectural anatomy of selected contemporary buildings. Use of graphic techniques of analysis to develop an understanding of their basic compositional principles and language. (Workshop)

Prerequisite: Permission of the School.

Lecture, seminar, lab or field work six hours a week.

Architecture 79.333 ★

Workshop: Architecture as Painting

Analysis of architecture for its elemental, formal and narrative properties. These relationships "re-represented" through the medium of painting. Architecture as analogy to painting. (Workshop)

Prerequisite: Permission of the School.

Lecture, seminar, lab or field work six hours a week.

Architecture 79.340 ★

Workshop: Visual Design

Development of the capacity to visualize and communicate in several graphic media. Development of sensitivity to form, structure, space, texture and colour. May involve historical investigation. (Workshop)

Prerequisite: Permission of the School.

Lecture, seminar, lab or field work six hours a week.

Architecture 79.341 ★

Workshop: Photography

Traditional and alternative techniques for image making and manipulation. Basic image formation techniques, advanced darkroom manipulations, past-darkroom imaging, and digital imaging within a theoretical overview of current photographic processes and techniques. (Workshop)

Prerequisite: Permission of the School.

Lecture, seminar, lab or field work six hours a week.

Architecture 79.391 ★

Selected Topics: Studies in Architectural Techniques

A specific aspect of architecture in the area of architectural techniques. Topics vary from year to year. (Elective Course)

Prerequisite: Permission of the School.

Architecture 79.392 ★

Selected Topics: Workshop in Architectural Techniques

A specific aspect of architecture in the area of architectural techniques and cooperative problem-solving. Topics vary from year to year. (Workshop)

Prerequisite: Permission of the School.

Lecture, seminar, lab or field work six hours a week.

Architecture 79.412 ★

Problems in Computing

Various types of non-numeric data, their representation within primary and secondary storage, and the manipulation of various representations. Comparative evaluation of languages for non-numeric problems. (Elective Course)

Precludes additional credit for Architecture 79.312 ★.

Prerequisite: Permission of the School.

Lectures two hours a week, laboratory two hours a week.

Architecture 79.488 ★

Independent Study

(Elective Course)

Design Studios/Design Thesis/Research

Architecture 80.105 ★

Drawing

Free-hand drawing as a way of observing and understanding the world. Various media and techniques introduced through a wide range of studio and outdoor exercises. (Core Course)

Prerequisite: Registration in the B.A.S. program.

Six hours a week.

First offered 1998-99.

Architecture 80.115 (1.0 credit)

Studio 1

Spatial and temporal experience of architecture through various drawings and modeling exercises. Observation of existing and imagination of possible architectural environments. On location at selected sites. (Core Course)

Prerequisite: Registration in the B.A.S. program.

Studio eight hours a week.

First offered 1998-99.

Architecture 80.215 (1.5 credits)

Studio 2

Development of cultural imagination within the field of architecture. Inhabitation and spatial definition are explored through analysis and design of small-scale environments. Representational skills developed, including the conventions of architectural drawing and modelling. (Core Course)

Prerequisite: Architecture 80.115.

Studio time twelve hours a week.

First offered 1999-2000.

Architecture

Architecture 80.216 (1.5 credits)

Studio 3

Small-scale building projects explore architectural design as a form of cultural expression. Consideration of site, program, and the materials of building as the means for shaping architecture. (Core Course)

Prerequisite: Architecture 80.215.

Studio time twelve hours a week.

First offered 1999-2000.

Architecture 80.304 (1.5 credits)

Design Studio 3A

The principles, vocabularies and craft of architecture within the contexts of purpose, place and precedent. Small-scale building in the natural and urban landscape. (Core Course for B.Arch. students)

Prerequisites: Architecture 80.211 and 80.212.

Studio time twelve hours a week.

Last offered 1999-2000.

Architecture 80.306 (1.5 credits)

Design Studio 3B

The continuation of the theme of Architecture 80.304 with an increase in project scope and complexity. (Core Course for B.Arch. Students)

Prerequisites: Architecture 80.211 and 80.212 and 80.304.

Studio time twelve hours a week.

Last offered 1999-2000.

Architecture 80.315 (1.5 credits)

Studio 4

Sensory components of architecture: their use, effect, and symbolic potential. Light and lighting, sound, the sensation of heat and cold, and related phenomena studied in modest building proposals. Social considerations of architecture. The conventions of architectural drawing. (Core Course)

Prerequisite: Architecture 80.216.

Studio time twelve hours a week.

First offered 2000-2001.

Architecture 80.316 (1.5 credits)

Studio 5

Building materials and practices within the context of increasingly complex building programs. Social context of architecture in relation to material expression. Modeling is stressed. (Core Course)

Prerequisite: Architecture 80.315.

Studio time twelve hours a week.

First offered 2000-2001.

Architecture 80.403 (1.5 credits)

Design Studio 4A

The principles and vocabularies arising from the relationship between architecture and the urban context in which it is situated. (Core Course for B.Arch. students)

Prerequisites: Architecture 80.304 and 80.306.

Studio time twelve hours a week.

Last offered 2000-2001.

Architecture 80.405 (1.5 credits)

Design Studio 4B

The principles and vocabulary of construction and technique as primary generators of architectural form. (Core Course for B.Arch. students)

Prerequisites: Architecture 80.304, 80.306 and 80.403.

Studio time twelve hours a week.

Last offered 2000-2001.

Architecture 80.415 (1.5 credits)

Studio 6

Issues of program and site, as the culturally defining aspects of architectural practice within complex urban and social situations, through the use of difficult sites and hybrid programs. Projects brought to a high degree of formal and graphic resolution. (Core Course)

Prerequisite: Architecture 80.316.

Studio time twelve hours a week.

First offered 2000-2001.

Architecture 80.416 (1.5 credits)

Studio 7

The role of architecture in culture, stressing site and program with respect to their historic, social, and ecological implications. Synthesis of issues, methods and techniques of the undergraduate studio program. (Core Course)

Prerequisite: Architecture 80.415.

Studio time twelve hours a week.

First offered 2001-2002.

Architecture 80.440 (1.5 credits)

Design Studio 5A

Design projects of complexity and theoretical rigour. Visiting Critic Studios may be taken. (Core Course for B.Arch. students)

Prerequisite: Fifth-year standing.

Studio time twelve hours a week.

Last offered 2001-2002.

Architecture 80.458 (2.5 credits)

Design Studio 5B

Student-initiated design of a suitable building project; undertaken with the advice and approval of studio faculty. (Core Course for B.Arch. students)

Prerequisite: Fifth-year standing.

Studio time twenty hours a week.

Last offered 2001-2002.

Architecture 80.460 (2.5 credits)

Research Thesis 5.1

Opportunity for scholarly research in topics related to architecture. Thesis proposal requires approval by the Thesis Committee. The final submission must be within a prescribed format. (Core Course for B.Arch. students)

Prerequisites: Fifth-year standing and approved thesis proposal.

Last offered 2001-2002.

Architecture 80.461 (2.5 credits)

Research Thesis 5.2

Opportunity for scholarly research in topics related to architecture. Thesis proposal requires approval by the Thesis Committee. The final submission must be within a prescribed format. In exceptional cases the Thesis Committee may allow this to be a continuation of Architecture 80.460. (Core Course for B.Arch. students)

Prerequisites: Fifth-year standing and approved thesis proposal.

Last offered 2001-2002.

Architecture 80.466 (2.5 credits)

Design Thesis 5.1

Opportunity for in-depth exploration of an architectural idea or issue. The thesis proposal requires approval by the Thesis Committee. (Core Course for B.Arch. students)

Prerequisites: Fifth-year standing and approved thesis proposal.

Last offered 2001-2002.

Architecture 80.467 (2.5 credits)

Design Thesis 5.2

Opportunity for in-depth exploration of an architectural idea or issue. The thesis proposal requires approval by the Thesis Committee. In exceptional cases the Thesis Committee may allow this to be a continuation of Architecture 80.466. (Core Course for B.Arch. students)

Prerequisites: Fifth-year standing and approved thesis proposal.
Last offered 2001-2002.

Architecture 80.470 (2.5 credits)

Selected Topics Studio

In-depth exploration of an architectural idea or issue, including a directed studies component, given by the studio professor, that reinforces the explorations in the studio. (Core Course for B.Arch. students.)

Prerequisites: Fifth-year standing and permission of the School.
Last offered in 2001-2002.

Studies in Art and Culture: Art History, Film Studies, Music (Arts and Social Sciences)

423 St. Patrick's Building
Telephone: 520-3993

Academic Administration

Director, Bryan Gillingham

Assistant Director, Film Studies, Chris Faulkner

Assistant Director, Art History, Randi Klebanoff

Assistant Director, Music, Bryan Gillingham

Teaching Staff

Professor Emeritus

George Swinton (Art History)

Professors

P. Cardy (Music) • **C.G. Faulkner** (Film Studies) • **G. Finn** (Cultural Studies) • **B. Gillingham** (Music) • **A. Gillmor** (Music) • **E. Keillor** (Music) • **Z. Pick** (Film Studies) • **J. Shepherd** (Music)

Associate Professors

A. Carr (Art History) • **K. Crossman** (Art History) • **M. Langer** (Film Studies) • **D. le Berrurier** (Art History) • **N. Luckyj** (Art History) • **P. MacFadden** (Film Studies) • **G. McKnight** (Film Studies) • **R. Mesley** (Art History) • **D. Piper** (Music)

Assistant Professors

R. Klebanoff (Art History) • **A. Loisele** (Film Studies) • **L.U. Marks** (Film Studies) • **C. O'Brien** (Film Studies), **C. Payne** (Art History)

Instructor

J. Giles (Music)

Adjunct Professors

Blaine Allen, Queen's University (Film Studies) • **Peter Baxter**, Queen's University (Film Studies) • **Michael Bell**, Carleton University Art Gallery (Art History) • **Rosemarie Bergmann** (Art History) • **Ted Brasser** (Art History) • **Clifford Brown** (Art History) • **Christina Cameron**, Canadian Parks Service (Art History) • **David Gardner** (Music) • **Peter Harcourt** (Film Studies) • **Stephen Inglis**, Canadian Museum of Civilization (Art History) • **Helmut Kallmann**, National Library of Canada (Music) • **Lily Koltun**, National Archives of Canada (Art History) • **Andrea Laforet**, Canadian Museum of Civilization (Art History) • **George MacDonald**, Canadian Museum of Civilization (Art History) • **Lora Matthews** (Music) • **Gerald McMaster**, Canadian Museum of Civilization (Art History) • **Diana Nemiroff**, National Gallery of Canada (Art History) • **Paolo Bellomia** (Music) • **Peter Wicke**, Direktor Forschungszentrum populäre Musik, Humboldt Universität (Music)

Sessional Lecturers

Michael Bussière (Music) • **Lisette Canton** (Music) • **Patricia Goodspeed** (Film Studies) • **Dr. Maureen Korp** (Art History) • **Dr. Diana Nemiroff** (Art History) • **Ann Schau** (Music) • **Alan Stanbridge** (Music) • **Barbara Stevenson** (Art History)

Research Associates

Robert Barclay (Music) • **James Burant**, National Archives of Canada (Art History) • **Clifford Ford**, Canadian Musical Heritage Society (Music) • **Anne-Marie Gaston** (Music) • **Eva Major-Marothy**, National Archives of Canada (Art History) • **Melissa Rombout**, National Archives of Canada (Art History) • **Patricia D. Sutherland**, Canadian Museum of Civilization (Art History) • **Judy Thompson**, Canadian Museum of Civilization (Art History) • **Carl Widstrand** (Music)

General Information

The School for Studies in Art and Culture administers the B.A. (Honours) degree in Art and Culture as well as the University's degree programs in Art History, Film Studies and Music. Details of these degree programs may be found under separate entries for Art History (p. 133), Film Studies (p. 248), and Music (p. 366).

The School, through the Office of the Director, provides advice to students wishing to submit a coherent pattern of courses on an area of the Visual and Performing Arts for a B.A. or B.A. (Honours) (Directed Interdisciplinary Studies). Details of this program may be found under separate entries for the Directed Interdisciplinary Studies. (p. 207)

B.A. (Honours) in Art and Culture

General Information

The School for Studies in Art and Culture offers a B.A. (Honours) program in Theories of Art and Culture which draws on the School's courses in Art History, Film Studies and Music as well as on the School's interdisciplinary courses in Art and Culture. It is also possible to take courses in disciplines other than Art History, Film Studies and Music as core and optional components of the program.

The disciplines of the School share a common interest in areas such as cultural theory, Canadian art and culture, aboriginal art and culture, issues of gender, and the situation of women in art and culture. The B.A. (Honours) program in Theories of Art and Culture enables students to gain a focused, comprehensive and systematic knowledge of areas of inquiry such as critical theory, cultural

theory, aesthetics, multiculturalism, post-colonialism and feminism in these areas as they are applied to the study of art and culture in both Western and non-Western societies and in all historical periods. In conjunction with their study of theory, students will be encouraged to follow a sequence of courses in at least two of Art History, Film Studies and Music.

Graduation Regulations

In order to graduate, students must fulfill all University graduation Regulations (see p. 48), all Faculty regulations including those relating to First-Year Seminars and Breadth requirements (see p. 63), in addition to all discipline regulations and requirements as set out below.

B.A. (Honours) in Art and Culture:

Each prospective student must consult the School for advice before entering the program.

The B.A. (Honours) program requires 20.0 credits, including 10.0 credits as follows:

First Year

2.0 credits from First-Year Seminar 01.101, Art History 11.100, 11.120 ★, 11.121 ★, Film Studies 19.100, Music 30.101 ★, 30.102 ★.

Second Year

Art and Culture 08.200;

2.0 credits from 200-level courses in at least two of Art History, Film Studies and Music.

Third Year

1.0 credit chosen from Art History 11.316 ★, Film Studies 19.301 ★, 19.351 ★, Music 30.300;

2.0 credits chosen from the following courses:

Art and Culture 08.395;

any 300-level course in Art History:

Film Studies 19.315 ★, 19.329 ★, 19.331 ★, 19.333, 19.342 ★, 19.371 ★, 19.381 ★;

Music 30.313 ★, 30.314 ★, 30.332 ★, 30.342 ★, 30.380 ★;

Sociology-Anthropology 56.383 ★, 56.384 ★, 56.385 ★.

Fourth Year

1.0 credit chosen from Art and Culture 08.400 ★, 08.401 ★, 08.402 ★, 08.403 ★;

1.0 credit chosen from the following courses:

Art History 11.400 ★, 11.404 ★, 11.405 ★, 11.435 ★, 11.461 ★, 11.480 ★, 11.487 ★, 11.499;

Film Studies 19.400, 19.421 ★, 19.429 ★, 19.441 ★, 19.451 ★, 19.480 ★, 19.485 ★, 19.491 ★, 19.495;

Music 30.430 ★, 30.433 ★, 30.473 ★, 30.477 ★, 30.480 ★, 30.481 ★, 30.498.

Note: It is strongly recommended that students take 1.0 credit in a language other than English.

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

The School for Studies in Art and Culture offers the following courses in the study of art and culture:

First-Year Seminar in Art and Culture 01.101

Reading Art and Culture

Development of academic writing and study skills through a close analysis of individual works and an examination of theories, aesthetic issues, and critical perspectives found in the literature of music, art history and film studies. Limited enrolment.

Requirement for Breadth, B.A. and B.A.(Honours) degrees

Category for Breadth	Courses in this unit
The temporal dimension of human societies, analyzing times before the present era or societies other than our own	
The artifacts of the imagination in literature and/or other forms, or that addresses the life of the imagination and culture.	All courses in Art and Culture
The understanding of social, technological and/or natural processes and the ways in which that understanding is obtained in science and social science.	
Matters of human values, ethics and social responsibilities	

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminar three hours a week.

Art and Culture 08.115

Introduction to Media and Technology in Art and Culture

This course provides students with an introduction to the technological innovations which have had significant impact on the course of twentieth-century cultural and artistic practices. This introduction is achieved through a combination of academic and practical studio work.

Prerequisite: Enrolment in one of the programs of the School for Studies in Art and Culture or the School of Journalism and Communication, or in the Arts Canterbury program, and permission of the School.

Lectures and studio demonstrations three hours a week.

Art and Culture 08.200

Theories of Art and Culture

Major writings on art and culture in historical Western traditions with particular reference to the contents and concerns of the three disciplines of the School.

Prerequisite: Second-year standing in the Program or permission of the School.

Lecture three hours a week.

Art and Culture 08.395

Visual and Performing Arts in the Twentieth Century

This interdisciplinary course is designed to examine selected aspects of the creation, distribution and reception of the arts in this century. The focus of the course is on the interplay of aesthetics, ideology and technology in music, theatre, film, art and architecture.

Prerequisite: Third-year standing and permission of the School.

Lectures three hours a week.

Art and Culture 08.400 ★

Topics in Cultural Studies

Selected topics in the development of cultural studies as an interrelated series of intellectual trajectories originating in England during the late 1950s. Topics may change from year to year.

Prerequisite: Fourth-year standing in the Program or permission of the School.

Seminar three hours a week.

Art and Culture 08.401 ★

Aspects of Modernism in Art and Culture

Selected aspects of modernist theory and practice in art and culture. Topics may change from year to year and may include the arts and European colonialism; 'primitivism'; practices and theories of the avant-garde; surrealism; expressionism; art and the popular; modernism and myth.

Prerequisite: Fourth-year standing in the Program or permission of the School.

Seminar three hours a week.

Art and Culture 08.402 ★

Topics in Audiovisual Cultures

Selected aspects of the audio-visual cultures of the late nineteenth and twentieth centuries. (Also listed as Film Studies 19.402 ★.)

Prerequisite: Fourth-year standing in the Program or permission of the School.

Seminar three hours a week.

Art and Culture 08.403 ★

Cultural Theory in Canadian Contexts

Established and contemporary theories of cultures developed within Canadian contexts.

Prerequisite: Fourth-year standing in the Program or permission of the School.

Lectures three hours a week.

Art and Culture 08.490 ★

Special Topic in the Study of Art and Culture

This course is designed specifically for Honours students in the School interested in interdisciplinary aspects of their course of study. The course offerings change from year to year.

Prerequisite: Fourth-year standing in one of the School's degree programs or permission of the School.

Lectures and seminars three hours a week.

Art and Culture 08.491 ★

Special Topic in the Study of Art and Culture

This course is designed specifically for Honours students in the School interested in interdisciplinary aspects of their course of study. The course offerings change from year to year.

Prerequisite: Fourth-year standing in one of the School's degree programs or permission of the School.

Lectures and seminars three hours a week.

School for Studies in Art and Culture

Art History

(Arts and Social Sciences)

423 St. Patrick's Building
Telephone: 520-2342

Academic Administration

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Assistant Director, Randi Klebanoff

Supervisor of Graduate Program, Angela Carr

Supervisor of Undergraduate Studies, Natalie Luckyj

Supervisor of History and Theory of Architecture Programs, K. Crossman

Supervisor of Practica, Carol Payne

Teaching Staff

Professor Emeritus

George Swinton, B.A. (McGill)

Associate Professors

Michael Bell, B.A., M.A. (Toronto) • **Diane O. le Berrurier**, Cands. H.A.A., Cands. Ph.H.S., Lics. H.A.A., Agreg. H.A.A. (Université Libre de Bruxelles), M.A., Ph.D. (Chicago) • **Angela Carr**, LL.B. (York) B.A., M.A., Phil.M., Ph.D. (Toronto) • **Kelly J. Crossman**, B.A. (Winnipeg), M.A. (Toronto), Ph.D. (Edinburgh) • **Natalie Luckyj**, B.A., M.A. (Toronto) • **Roger J. Mesley**, B.A., M.A., Ph.D. (Toronto)

Assistant Professors

Randi Paula Klebanoff, B.A. (Concordia), M.A. (British Columbia), Ph.D. (Harvard) • **Carol Payne**, B.F.A. (York), M.A., Ph.D. (Boston)

Sessional Lecturers

Maureen Korp • **George Kellaris** • **Diana Nemiroff**

Adjunct Research Professors

Rosemarie Bergmann • **Ted Brasser** • **Clifford Brown** • **Christina Cameron**, Canadian Parks Service • **Stephen Inglis**, Canadian Museum of Civilization • **Lilly Koltun**, National Archives of Canada • **Andrea Laforet**, Canadian Museum of Civilization • **George MacDonald**, Canadian Museum of Civilization • **Gerald McMaster**, Canadian Museum of Civilization • **Diana Nemiroff**, National Gallery of Canada

Research Associates

James Burant, National Archives of Canada • **Eva Major-Marothy**, National Archives of Canada • **Melissa Rombout** • **Patricia Sutherland**, Canadian Museum of Civilization • **Judy Thompson**, Canadian Museum of Civilization

Slide Curator

Barbara Stevenson

Assistant Slide Curator

Carole Luff

General Information

The discipline of Art History offers a wide range of courses, primarily in the history of Western art. Consequently, B.A. (Honours) and B.A. programs in Art History are flexible, and within the context of these degree programs students are encouraged to take courses in other departments and disciplines of the Faculty of Arts and Social Sciences such as Classics, Film Studies, History, Languages and Literatures, Music, Philosophy and Religion, as well as in the Faculties of Science and Public Affairs and Management.

Within the requirements for B.A. (Honours) and B.A. degrees, students are expected to take courses in the areas that form the undergraduate curriculum: Ancient, Medieval, Renaissance, Baroque and Rococo, Romantic, Modern, Contemporary, North American and Native Art. Courses in the theory of art and in art criticism are offered as adjuncts to those in art history.

A special feature of the Carleton program is an undergraduate practicum, in which degree students in their Third- or Fourth-year may receive up to 1.0 credit in Art History for supervised practical experience, working on specific projects in an Ottawa museum or

related setting, or on an archaeological site: for example, The National Archives of Canada, The Canadian Museum of Civilization, The National Gallery of Canada.

Courses in the Faculties of Arts and Social Sciences, Science and Public Affairs and Management provide options that complement art history and support certain specializations or career plans in art history. For example, courses in history, literature, languages and music are related, often directly, to the study of all art historical periods. Courses in film studies relate to contemporary art. Chemistry and/or studio work are especially recommended for students wishing to do post-graduate work in restoration and conservation. Certain offerings in sociology and anthropology are particularly useful for students working in the area of native art.

B.A. (Honours) and B.A. students in Art History should consider taking a studio course that acquaints them with techniques and materials that have been applied in the history of art, either through the University of Ottawa exchange agreement (see p. 45) or by means of a Letter of Permission. 1.0 credit in studio may be counted as a general option in either the B.A. (Honours) or B.A. program.

Such courses must be taken in accordance with University policy and must be approved in advance by the Registrarial Services office.

Students from other departments and disciplines, part-time students and Special students may discover that courses in Art History complement their interests or their programs. Such students may enrol in any course in Art History without the stated prerequisite if permission of the discipline has been obtained. Preparatory reading is expected of all students who enrol without the stated prerequisite, and appropriate reading lists are available from the Undergraduate Administrative Assistant throughout the year.

Graduation Regulations

In order to graduate, students must fulfill all University graduation regulations (see p. 48), all Faculty regulations, including those for First-Year Seminars and Breadth requirements (see p. 63), and all Major regulations and requirements set out below.

Courses Open to First-Year Students

All First-year Art History courses are open to first-year students. Second-year courses are open to all students with Second-year standing. Many of the course offerings fulfill the requirement for breadth in the new B.A. program. All students taking an Art History course above the 100-level without the background of Art History 11.110★/11.111★ are strongly advised to prepare themselves by reading a general survey of art history, such as Marilyn Stokstad, *Art History*, prior to registration in such a course.

Listing of Courses by Field

Students in the B.A. (Honours), Combined B.A. (Honours) and B.A. programs are required to balance their studies by taking credits above the 100-level from each of two broad divisions detailed below. Requirements are specified under program descriptions which follow. The two fields respectively comprise the following courses:

Area 1. Course focus before 1750:

Art History 11.210★, 11.222★, 11.230★, 11.243★, 11.321★, 11.325★, 11.327★, 11.331★, 11.334★, 11.422★, 11.423★, 11.424★, and 11.435★.

Area 2. Course focus after 1750:

Art History 11.202★, 11.203★, 11.252★, 11.260★, 11.261★, 11.268★, 11.287★, 11.300★, 11.301★, 11.302★, 11.305★, 11.355★, 11.356★, 11.357★, 11.360★, 11.361★, 11.362★, 11.369★, 11.400★, 11.401★, 11.455★, 11.460★, 11.461★, 11.462★ and 11.487★.

There are some courses in which the period may vary from year to year, or from student to student. These are: 11.375★, 11.390★, 11.391★, 11.392★, 11.393★, 11.475★, 11.480★, 11.489★, 11.490★, 11.491★, 11.492★ and 11.499. Students should consult the department about the nature and availability of such courses from year to year.

Honours Programs

B.A. (Honours) in Art History

The B.A. (Honours) degree in Art History is designed for students contemplating graduate work in art history or museology, or who for other reasons wish to enrich their knowledge through an additional year of concentrated study.

A balanced range of courses, encompassing major fields, should be chosen in consultation with the Majors Supervisor. Close attention must be paid to prerequisites needed for upper-year courses. 10.0 credits in Art History are required, as follows:

1. 11.110★ and 11.111★ (to be completed by the end of second year; that is, normally within the first ten credits taken);

2. at least 2.0 credits at the 200-level;

3. at least 3.0 credits at the 300-level, including 11.316;

4. at least 3.0 credits at the 400-level, no more than 1.5 of which may be directed readings or honours research essay credits.

5. 1.0 additional credit in Art History.

6. At least 1.5 credits in items 2-5 must be from Area 1 (before 1750) and at least 1.5 must be from Area 2 (after 1750) as listed above.

Combined B.A. (Honours)

The Combined Honours degree program with other departments and disciplines requires a minimum of 7.0 Art History credits, which must include:

1. 11.110★ and 11.111★;

2. at least 4.0 credits above the 100-level, of which at least 2.0 must be at the 400-level, no more than 1.0 of which may be directed readings or Honours Research Essay credit.

3. at least 1.0 of the credits chosen above the 100-level must be from courses focusing on material before 1750 and 1.0 credit from courses focusing on material after 1750 as listed above.]

B.A. (Honours) in History and Theory of Architecture

This program requires a minimum of 10.0 credits in Art History and Architecture including:

1. 11.110★ and 11.111★;

2. 11.120★ and 11.121★;

3. 8.0 credits from the list of Approved Courses, including at least 2.0 at the 300- and 1.0 at the 400-level. At least 2.0 credits must be taken from approved Art History courses and 2.0 credits from approved Architecture courses. No more than 1.5 credits may be from directed readings and/or from the Honours research essay.

Students should note that Architecture courses taken to fulfill the requirements of this program are not transferable to other degree programs in the Division of Arts and Social Sciences (with the exception of the Combined B.A. program in History and Theory of Architecture).

Approved Courses

Art History 11.222★, 11.230★, 11.268★, 11.286★, 11.287★, 11.302★, 11.305★, 11.327★, 11.369★, 11.390★, 11.391★, 11.392★, 11.393★, 11.461★, 11.480★, 11.490★, 11.491★, 11.492★;

Architecture 76.100★, 76.105★, 76.230★, 76.402★, 76.404★, 76.406★, 76.408★, 76.409★, 76.410★, 76.415★, 76.422★, 76.423★, 76.424★, 76.430★, 76.431★, 76.432★, 76.433★, 76.434★, 76.435★, 76.436★, 76.437★, 76.438★, 76.439★, 76.452★, 76.455★, 76.481★, 76.488★, 77.135★, 77.201★, 77.231★, 77.300★, 77.301★, 77.313★, 77.314★, 77.316★, 77.317★, 77.322★, 77.350★, 77.406★, 77.410★, 77.412★, 77.413★, 77.420★, 77.422★, 77.430★, 77.440★, 77.450★, 77.480★, 77.481★, 77.488★, 78.391★, 78.430★, 78.440★, 78.450★, 78.488★, 82.105★, 85.100★, 85.101★

B.A. Programs

B.A. Program in Art History

The B.A. in Art History is designed for students who wish a liberal arts education with an emphasis on art history. Students who decide that they wish to do graduate work, or who contemplate working in museology, should transfer to the Honours program as early as possible.

A balanced range of courses should be chosen in consultation with the Majors Supervisor. 6.0 credits in Art History are required as follows:

1. 11.110★ and 11.111★ (to be completed by the end of second year);
2. at least 2.0 credits at the 200-level;
3. at least 2.0 credits at the 300- or 400-levels;
4. 1.0 additional credit in Art History;
5. at least 1.0 credit in items 2-4 must be from Area 1 (before 1750) and at least 1.0 credit must be from Area 2 (after 1750) as listed above.

B.A. in History and Theory of Architecture

This program is offered in conjunction with the School of Architecture and is intended for students with a special interest in the study of architecture.

This program requires at least 7.0 credits in Art History and Architecture including:

1. 11.110★, 11.111★;
2. 11.120★, 11.121★;
3. 4.0 credits from the list of Approved Courses including at least 1.0 credit at the 300- or 400-level, and at least 1.0 credit from Art History courses and 1.0 credit from the approved Architecture courses (see above);
4. 1.0 additional credit in Art History.

Students should note that Architecture courses taken to fulfill the requirements of this program are not transferable to other degree programs in the Division of Arts and Social Sciences except in the B.A.(Honours) program in History and Theory of Architecture.

Approved Courses

Art History: 11.222★, 11.230★, 11.268★, 11.286★, 11.287★, 11.302★, 11.305★, 11.327★, 11.369★, 11.390★, 11.391★, 11.392★, 11.393★, 11.461★, 11.480★, 11.490★, 11.491★, 11.492★;

Architecture: 76.100★, 76.105★, 76.230★, 76.402★, 76.404★, 76.406★, 76.408★, 76.409★, 76.410★, 76.415★, 76.422★, 76.423★, 76.424★, 76.430★, 76.431★, 76.432★, 76.433★, 76.434★, 76.435★, 76.436★, 76.437★, 76.438★, 76.429★, 76.452★, 76.455★, 76.481★, 76.488★, 77.135★, 77.201★, 77.231★, 77.300★, 77.301★, 77.313★, 77.314★, 77.316★, 77.317★, 77.322★, 77.350★, 77.406★, 77.410★, 77.412★, 77.413★, 77.420★, 77.422★, 77.430★, 77.440★, 77.450★, 77.480★, 77.481★, 77.418★, 78.391★, 78.430★, 78.440★, 78.450★, 78.488★, 82.105★, 85.100★, 85.101★.

Minor in Art History

Students registered in other programs may obtain a Minor in Art History. A minor in Art History comprises 4.0 credits, as follows:

1. 11.110★ and 11.111★;
2. 1.5 credits at the 200-level;
3. 1.5 credits at the 300- or 400-level.

Language Study

All students in Art History are strongly advised to pursue language study through courses available at Carleton. If advanced study in Art History is contemplated, students should develop a reading knowledge of French and any other languages pertinent to specific fields. In many areas of graduate study and employment such proficiency will be required. Students are advised to seek counseling concerning this aspect of their program.

Graduate Study

A Master of Arts program in Canadian Art History, including Canadian native art, is offered through the Art History program of the School for Studies in Art and Culture. For further details see the current Calendar of the Faculty of Graduate Studies and Research.

Requirement for Breadth, B.A. and B.A.(Honours) Degrees

Category for Breadth	Courses in this unit
The temporal dimension of human societies, analyzing times before the present era or societies other than our own	(11.)205★, 206★, 210★, 286★
The artifacts of the imagination in literature and/or other forms, or that addresses the life of the imagination and culture.	All Art History courses not listed under any other category
The understanding of social, technological and/or natural processes and the ways in which that understanding is obtained in science and social science.	
Matters of human values, ethics and social responsibilities	

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Art History 11.110★

Art: Prehistory to the Renaissance

A survey of art and architecture from prehistory to the Renaissance. Issues, themes and methods in Art History will be demonstrated through their application to selected examples within a chronological framework.

Precludes additional credit for Art History 11.100.

Lectures three hours a week, tutorial one hour a week.

Art History 11.111★

Art: Renaissance to the Present

A survey of art and architecture from the Renaissance to the present. Issues, themes and methods in Art History will be demonstrated through their application to selected examples within a chronological framework.

Precludes additional credit for Art History 11.100.

Lectures three hours a week, tutorial one hour a week.

Art History 11.115★

Art as Visual Communication

A wide variety of visual material is organized topically to examine the elements of art (line, shape, value, colour, texture, space), the principles of pictorial organization, the materials and techniques of art, and recurrent tendencies in artistic styles and outlooks.

Lectures three hours a week.

Art History 11.120★

Introduction to Architectural History

A survey of architecture including principles of structure and form, vernacular traditions and the architecture of high culture in Asia and the West before 1500.

Lectures three hours a week, tutorial one hour a week.

Art History 11.121 ★

Introduction to Architectural History: Renaissance to the Present

A selective survey of world architecture from 1500 to the present. This course explores architectural history as constructed narrative by reference to current ideological debates over margin and centre. Lectures three hours a week, tutorial one hour a week.

Art History 11.202 ★

Historical Canadian Art: Colonial Settlement to 1950

Historical Canadian art, including painting, sculpture and photography, from the colonial settlement in New France to the roots of the modern movement before 1950. Lectures three hours a week.

Art History 11.203 ★

Canadian Art in the Twentieth Century

This course will examine the major developments in painting, sculpture, graphic art, photography and design from the early twentieth century to the present day. Issues such as regionalism, nationalism, gender and identity will be considered in the context of the works in National and local collections in Ottawa. Prerequisite: Second-year standing or permission of the Discipline. Lectures three hours a week.

Art History 11.205 ★

Arts of the First Peoples: The Woodlands, the Plains and the Subarctic

This course is an introductory survey of the visual artistic traditions of the aboriginal peoples of the eastern and central regions of North America including the Woodlands, the eastern subarctic and the Plains from prehistoric to contemporary times. Lectures three hours a week.

Art History 11.206 ★

Arts of the First Peoples: The Southwest, the West Coast and the Arctic

This course is an introductory survey of the visual artistic traditions of the aboriginal peoples of the western and northern regions of North America including the southwest, the plateau, northwest coast and the arctic from prehistoric to contemporary times. Lectures three hours a week.

Art History 11.210 ★

Greek and Roman Art and Archaeology

The art, architecture and archaeology of Greece and Rome. Vase painting, sculpture, Greek and Roman architecture, town planning and analogous arts are studied. Prerequisite: Second-year standing or permission of the Discipline. Lectures three hours a week.

Art History 11.222 ★

Medieval Art

This course examines medieval art from the earliest Christian productions through the late Gothic period. Reference will be made to both Western and Byzantine artistic monuments. Precludes additional credit for Art History 11.220 ★ and 11.221 ★. Prerequisite: Second-year standing or permission of the Discipline. Lectures three hours a week.

Art History 11.230 ★

Italian Renaissance Art

An examination of major works of art and architecture, issues and themes in the Italian Renaissance. The course concentrates on the fifteenth and sixteenth centuries, with a look at roots in the fourteenth. Prerequisite: Second-year standing or permission of the Discipline. Lectures three hours a week.

Art History 11.243 ★

European Art from 1600-1750

This course examines painting, sculpture and architecture in Eu-

rope from 1600-1750.

Precludes additional credit for Art History 11.241 ★ and 11.242 ★. Prerequisite: Second-year standing or permission of the Discipline. Lectures three hours a week.

Art History 11.252 ★

European Art from 1750-1900

This course examines major artistic movements in Europe from about 1750-1900. Class lectures emphasize Neo-Classicism, Romanticism and Realism. Precludes additional credit for 11.242 ★ and 11.250 ★. Prerequisite: Second-year standing or permission of the Discipline. Lectures three hours a week.

Art History 11.260 ★

Modern European Art 1900-1945

This course examines major artistic movements in Europe from about 1900 to 1945. Prerequisite: Second-year standing or permission of the Discipline. Lectures three hours a week.

Art History 11.261 ★

Introduction to the History of Photography

Issues, themes, movements in photography and individual photographers from the origins of the medium to the present. Lectures three hours a week.

Art History 11.268 ★

History and Theory of Architecture: The Nineteenth Century

This course examines selected topics in nineteenth-century architecture in Europe and North America. Emphasis is placed on the interaction of historiography, theory and architectural form. Precludes additional credit for Art History 11.368 ★ and Architecture 76.308 ★. Lectures three hours a week.

Art History 11.286 ★

Art and Ideas: From Ancient Greece to the Twentieth Century

A survey of theories that have shaped the Western approach to art and art criticism, including Plato, Aquinas, Kant, Hegel and Nietzsche. (Also listed as Philosophy 32.286 ★.) Lectures three hours a week.

Art History 11.287 ★

Art and Ideas: The Twentieth Century

A survey of theories that have shaped the Western approach to art and art criticism including formalist, psychological, sociological, phenomenological, semiotic, poststructural and aesthetic approaches and including such thinkers as Fry, Greenberg, Freud, Arnheim, Hauser, Heidegger and Derrida. (Also listed as Philosophy 32.287 ★.) Lectures three hours a week.

Art History 11.300 ★

Canadian Painting and Sculpture

This course examines particular aspects of nineteenth- and/or twentieth-century painting and sculpture in Canada. Prerequisite: Art History 11.202 ★ or 11.203 ★, or permission of the Discipline. Lectures three hours a week.

Art History 11.301 ★

Contemporary Canadian Art

This course examines in depth the art of selected groups and individuals working in Canada from 1945 to the present. Research assignments and class presentations make extensive use of works from collecting institutions in Ottawa. Prerequisite: Art History 11.203 ★ or permission of the Discipline. Lectures three hours a week.

Art History 11.302 ★

Canadian Architecture

Offered in the School of Architecture as Architecture 76.402 ★.

Prerequisites: Art History 11.110 ★ and 11.111 ★, or 11.120 ★ and 11.121 ★, or Architecture 76.120 ★ and 76.121 ★.

Art History 11.305 ★

American Architecture

This course studies the cultural history of the United States as expressed through its architectural heritage. Selected buildings and complexes from the earliest settlements through the early twentieth century are examined.

Prerequisite: Art History 11.121 ★ or permission of the Discipline. Lectures three hours a week.

Art History 11.306 ★

American Painting and Sculpture

This course studies the evolution of painting and sculpture in the United States from colonial times to the early twentieth century.

Lectures three hours a week.

Art History 11.311 ★

Studies in Greek and Roman Art and Archaeology

Period or theme in the art and archaeology of Ancient Greece and Rome. Topics may vary from year to year. (Also listed as Classical Civilization 13.335 ★.)

Prerequisite: Second-year standing or permission of the Discipline. Lectures three hours a week.

Art History 11.313 ★

Themes and Issues in African, Oceanic and Native American Arts

Approaches, issues and themes in the study of the artistic traditions of non-Western people in Africa, the Pacific and the Americas.

Lectures three hours a week.

Art History 11.314 ★

Inuit Art

This course surveys the prehistoric, historic and contemporary art of the Canadian Inuit with reference to the art of the Eskimos of Alaska and Greenland.

Lectures three hours a week.

Art History 11.316

History and Methods of Art History

The study of the history of art history and the methodologies and research tools employed by art historians.

Prerequisites: Eligibility for Third-year standing or higher and permission of the Discipline. Seminar three hours a week.

Art History 11.321 ★

Eastern Medieval Art

This course examines the sources and the development of the arts in the Byzantine Empire as well as the relationship of the artistic productions to those of neighbouring countries.

Precludes additional credit for Art History 11.221 ★.

Prerequisite: Art History 11.110 ★ or 11.222 ★ or permission of the Discipline.

Lectures three hours a week.

Art History 11.325 ★

Russian Art

The development of Russian art is studied from its origins into the eighteenth century with an emphasis on Byzantine influences as opposed to local characteristics.

Prerequisite: Art History 11.110 ★ or 11.222 ★ or permission of the Discipline.

Lectures three hours a week.

Art History 11.327 ★

Gothic Architecture and Monumental Sculpture

This course investigates the sources and development of Gothic architecture and monumental sculpture in Northern and Southern Europe from their origins in the twelfth century through the fifteenth century.

Prerequisite: Art History 11.110 ★ or 11.222 ★ or permission of the Discipline.

Lectures three hours a week.

Art History 11.331 ★

Visuality, Image and Identity in pre-Modern Europe

An exploration of such themes as art and the spectator, visual modes, gender, image and identity, art of civic life, narrative and space. Topics vary. Concentration on the fourteenth to sixteenth centuries, although periods discussed may span antiquity to the seventeenth century.

Precludes additional credit for Art History 11.330 ★.

Prerequisite: Art History 11.230 ★ or permission of the Discipline. Lectures three hours a week.

Art History 11.334 ★

Regional Studies in Renaissance Art

An exploration of Renaissance art which focuses on art production as specific to place. Topics vary. Regions which may be covered include: Florentine Renaissance; Venice and Rome in the sixteenth century; the Northern Renaissance.

Prerequisite: Third-year standing or permission of the Discipline. Lectures three hours a week.

Art History 11.355 ★

Impressionism in France

This course treats selected Impressionist artists such as Manet, Monet, Degas, Renoir, Caillebotte, Pissarro, Cassatt and Morisot. Cézanne and Seurat may also be included, as heirs of Impressionism.

Prerequisite: Art History 11.111 ★ or 11.252 ★ or permission of the Discipline.

Lectures three hours a week.

Art History 11.356 ★

Myth, Legend, Religion and the Occult in Art: 1850-1914

This course examines how a variety of artists, ranging in style from Pre-Raphaelites to pioneers of abstraction, had in common an Idealism that they expressed by iconography drawn from myth, legend, religions, Theosophy, mysticism and the occult.

Prerequisite: Art History 11.111 ★ or 11.252 ★ or permission of the Discipline.

Lectures three hours a week.

Art History 11.357 ★

Van Gogh

Following a brief survey of Van Gogh's Dutch period, this course examines intensively his life, writing and art from 1886-1890; i.e., the Paris, Arles, St. Rémy and Auvers-sur-Oise periods.

Prerequisite: Art History 11.111 ★ or 11.252 ★ or permission of the Discipline.

Lectures three hours a week.

Art History 11.360 ★

Art Since 1945

This course treats major artists and artistic movements from 1945 to the present. Emphasis is placed on the United States.

Prerequisite: Art History 11.260 ★ and Third-year standing or higher. Lectures three hours a week.

Art History 11.361 ★

Women, Art and Society

The work by women artists in Western Europe and North America will be examined with emphasis on the social, economic and political contexts for women's artistic production.

Prerequisite: Third-year standing or permission of the Discipline.
Lectures three hours a week.

Art History 11.362 ★

The History of Photography in Canada

Issues, themes, movements in photography and individual photographers from the arrival of the medium in Canada to the present.
Lectures three hours a week.

Art History 11.369 ★

Twentieth-Century Architecture

An examination of developments in architectural form and culture through the course of the twentieth century. Emphasis will be placed on the formation and subsequent critique of the Modern Movement. (Also listed as Architecture 76.221 ★.)

Precludes additional credit for Architecture 76.309 ★.

Prerequisite: Art History 11.120 ★ or 11.121 ★ or permission of the Discipline.

Lectures three hours a week.

Art History 11.375 ★

Selected Museum Exhibition

This course focuses on a major exhibition held at a local museum. Students enrolled in this course are expected to bear all travel and other costs arising from required visits to the museum.

Prerequisite: Third-year standing or permission of the Discipline.
Seminar and/or lectures three hours a week.

Art History 11.390 ★

Practicum in Art History

Practical experience gained by working on specific projects under the supervision of the staff of one of the museums or related settings in the Ottawa area. A maximum of 1.0 credit of practicum may be offered in fulfillment of Art History requirements.

Prerequisite: B.A. or B.A. (Honours) Art History registration with Third- or Fourth-year standing and a GPA of 9.0 or better in Art History courses, or permission of the Discipline.

Art History 11.391 ★

Practicum in Art History

Practical experience gained by working on specific projects under the supervision of the staff of one of the museums or related settings in the Ottawa area. A maximum of 1.0 credit of practicum may be offered in fulfillment of Art History requirements.

Prerequisite: B.A. or B.A. (Honours) Art History registration with Third- or Fourth-year standing and a GPA of 9.0 or better in Art History courses, and Art History 11.390 ★; or permission of the Discipline.

Art History 11.392 ★

Practicum in Art History

Practical experience gained by working on specific projects under the supervision of the staff of one of the museums or related settings in the Ottawa area. A maximum of 1.0 credit of practicum may be offered in fulfillment of Art History requirements.

Prerequisite: B.A. or B.A. (Honours) Art History registration with Third- or Fourth-year standing and a GPA of 9.0 or better in Art History courses, and Art History 11.390 ★ or 11.391 ★; or permission of the Discipline.

Art History 11.393 ★

Practicum in Art History through Archaeology

Practical experience from participating in specific archaeological projects under the supervision of project staff and Carleton faculty. Readings, lectures and study trips are integrated with the program. A maximum of 1.0 credit of practicum may be offered in fulfillment of Art History requirements.

Prerequisites: B.A. or B.A. (Honours) Art History registration with Third- or Fourth-year standing and a GPA of 9.0 or better in Art History courses, or permission of the Discipline.

Art History 11.400 ★

Topics in Historical Canadian Art

This seminar examines selected theoretical topics in historical Canadian art, including colonialism, national identity, race, gender, and class, as well as cultural policy.

Prerequisite: One of Art History 11.202 ★, 11.203 ★, 11.300 ★, or permission of the Discipline.

Seminar three hours a week.

Art History 11.401 ★

Aspects of Modern and Contemporary Art Practice in Canada

This course will examine a selected issue/theme in modern and contemporary Canadian art. Focus will be placed upon works in public collections in Ottawa with particular emphasis placed upon current exhibitions in the National Capital region.

Prerequisite: Art History 11.301 ★ and Fourth-year standing or permission of the Discipline.

Seminar three hours a week.

Art History 11.404 ★

Topics in Contemporary Inuit Art

This course examines selected aspects of the contemporary arts of Canadian Inuit artists.

Seminar three hours a week.

Art History 11.405 ★

Topics in Canadian Indian Art

Selected aspects of the contemporary arts of Canadian artists of Indian ancestry.

Seminar three hours a week.

Art History 11.406 ★

Topics in American Art

This seminar examines selected aspects of American art and architecture.

Prerequisite: Permission of the Discipline.

Seminar three hours a week.

Art History 11.422 ★

Topics in Eastern Medieval Art

This course studies aspects of Eastern Medieval art and their influences in Western Europe.

Prerequisite: Third-year standing in Art History or Art History 11.321 ★ or permission of the Discipline.

Seminar three hours a week.

Art History 11.423 ★

Topics in Western Medieval Art

This course focuses on aspects of Western Medieval art and their relationship to the Eastern Mediterranean area.

Prerequisite: Art History 11.220 ★ or 11.221 ★ or permission of the Discipline.

Seminar three hours a week.

Art History 11.424 ★

The Interrelationship of Art History and Underwater Archaeology

This course considers the history of underwater archaeology, its relation to the development of underwater technology and land archaeology, and some of the most interesting art historical finds in sunken cities and shipwrecks.

Prerequisites: Third-year standing or permission of the Discipline.
Seminar three hours a week.

Art History 11.435 ★

Topics in Renaissance Art

This seminar deals with selected aspects of Renaissance art and their influence.

Prerequisite: Art History 11.230 ★ or permission of the Discipline.
Seminar three hours a week.

Art History 11.455 ★

Topics in Nineteenth-Century European Art

This course examines selected aspects of nineteenth-century European art. Normally Gauguin in France and Odilon Redon in the Context of Symbolism are offered in alternate years.

Prerequisite: Art History 11.252 ★ or 11.355 ★, or permission of the Discipline.

Lectures and/or seminar three hours a week.

Art History 11.460 ★

Women and Modernism

This course will examine the work of twentieth-century women artists in Europe and North America in light of economic, social, political and artistic contexts. Painting, sculpture, photography as well as applied art, printmaking and design will be included.

Precludes additional credit for Art History 11.461 ★ (with the same topic).

Prerequisite: Art History 11.260 ★ or 11.361 ★ or permission of the Discipline.

Seminar three hours a week.

Art History 11.462 ★

Issues in the Theory and History of Photography

Relates the themes of selected theoretical texts on photography to specific examples of photographic practice.

Seminar three hours a week.

Art History 11.463 ★

Contemporary Environmental Art

This course examines contemporary inflections of "land-art", from 1960s Earthworks to more recent "Eco-Art" with overt ecological meaning or function. Reference is made to historical and prehistoric antecedents.

Precludes additional credit for Art History 11.461 ★ (with the same topic).

Prerequisite: Art History 11.360 ★, or Third-year standing or higher, or permission of the Discipline.

Lectures and/or seminar three hours a week.

Art History 11.475 ★

Seminar: Selected Museum Exhibition

Studies a major exhibition held at a local museum. Students enrolled in this course are expected to bear all travel and other costs arising from required visits to the museum.

Prerequisites: Third-year standing or permission of the Discipline.

Lectures and/or seminar three hours a week.

Art History 11.480 ★

Topics in Architectural History

This course examines selected aspects of architectural history from ancient times to the present.

Prerequisite: Third-year standing or permission of the Discipline.

Seminar three hours a week.

Art History 11.487 ★

Topics in Art Criticism

This course introduces major problems and theories in art criticism with particular attention to whether the theories can be accepted.

Prerequisite: Permission of the Discipline.

Seminar three hours a week.

Art History 11.489 ★

Topics in Art History

Selected aspects of art history from ancient times to the present.

Seminar three hours a week.

Art History 11.490 ★

Directed Readings and Research

Supervised readings and research projects. Guidelines must be obtained from the Supervisor of Undergraduate Studies prior to registration. A written project outline, approved by the supervising Art History faculty member, must be submitted to the Supervisor of Undergraduate Studies by the last day for course changes.

Prerequisites: Fourth-year Honours standing in Art History and permission of the Discipline.

Art History 11.491 ★

Directed Readings and Research

Supervised readings and research projects. Guidelines must be obtained from the Supervisor of Undergraduate Studies prior to registration. A written project outline, approved by the supervising Art History faculty member, must be submitted to the Supervisor of Undergraduate Studies by the last day for course changes.

Prerequisites: Fourth-year Honours in Art History standing and permission of the Discipline.

Art History 11.492 ★

Directed Readings and Research

Supervised readings and research projects. Guidelines must be obtained from the Supervisor of Undergraduate Studies prior to registration. A written project outline, approved by the supervising Art History faculty member, must be submitted to the Supervisor of Undergraduate Studies by the last day for course changes.

Prerequisites: Fourth-year Honours standing in Art History and permission of the Discipline.

Art History 11.499

Honours Research Essay

An essay of approximately 10,000 words, resulting from independent research, supervised by Art History faculty.

Prerequisites: Fourth-year Honours standing in Art History with a GPA of 9.0 or better calculated over all courses in Art History; and permission of the Discipline.

Biochemistry (Science)

2240 Herzberg Building
Telephone: 520-3515
Fax: 520-2569

Academic Administration

Director

J. Sinclair (until June 30, 1999)

Members of the Institute

J.W. ApSimon • P. Buist • N. Chaly • J.J. Cheetham • B. Hollebone • I.B. Lambert • J. Sinclair • M.L. Smith • K.B. Storey • J. Vierula • D.C. Wigfield • R.C. Wyndham

Associate Member

V.L. Seligy

Teaching Staff

Professors

K.B. Storey, B.Sc. (Calgary), Ph.D. (British Columbia), F.R.S.C. • **Chishium S. Tsai**, B.Sc. (Taiwan), M.Sc., Ph.D. (Purdue)

Associate Professors

Iain B. Lambert, B.Sc. (Guelph), Ph.D. (McMaster) • **J. Sinclair**, B.Sc., Dip.in Biophysics (Edinburgh), Ph.D. (East Anglia)

Assistant Professor

J.J. Cheetham, B.Sc., Ph.D. (McMaster)

Adjunct Research Professor

H. Yamazaki, M.S. (Hokkaido), Ph.D. (Wisconsin)

Graduation Regulations

In order to graduate, students must fulfill all University graduation Regulations (see p. 48) and all Faculty regulations (see p. 109), in addition to all regulations and requirements of the Institute as set out below.

Honours Programs

Honours Bachelor of Science in Biochemistry and Biotechnology

See description of this special program on p. 153.

Honours Bachelor of Science in Biochemistry

The Institute of Biochemistry also offers a four-year program leading to an Honours B.Sc. in Biochemistry, intended to provide more specialized training for biochemical research or a related career. An Honours degree with above-average standing is normally required for post-graduate studies in this discipline.

Students entering the program must satisfy the general requirements for B.Sc. Honours. The following 20.0 credits are required, taken in a pattern approved by the Director of the Institute:

1. Biology 61.103★, 61.214★, 61.314★, either 61.201★ or 61.202★, either 61.325★ or 61.335★, and 1.0 credit selected from approved 300- or 400-level Biology courses (see Note 6);

2. Chemistry 65.100, 65.210 or 65.211★ and 65.353★, 65.220 or 65.223★, and 65.224★, 65.233★, 65.321★, 65.322★, 65.325★;

3. (a) Biochemistry 63.220★, 63.305★, 63.310, 63.401★, and 63.497 or 63.498;

(b) At least 1.0 credit chosen from: Biochemistry 63.402★, 63.404★, 63.405★, 63.406★, 63.407★, 63.422★, 63.432, 63.440★;

4. Physics 75.101★ and 75.102★, or 75.107★ and 75.108★, Mathematics 69.107★, 69.117★, and 69.257★;

5. 2.0 approved arts or social science credits;

6. 1.5 credits related to the student's area of specialization. Some recommended courses include: Biochemistry courses listed in 3(b) above, 63.491★; Biology courses listed in note 6 below; Chemistry 65.212★, 65.311★, 65.312★, 65.353★, 65.354★, 65.370★, 65.380★, 65.422★, 65.423★; Physics 75.235★, 75.236★; Mathematics 69.207★, 69.208★, 69.217★; Computer Science 95.102★;

7. 1.0 free option credit or 0.5 free option credit if Biology 61.102 is taken in lieu of the Ontario Academic Credit in Biology.

Notes on Programs:

1. A completed credit for Biology 61.102 or 61.209★ and 61.230★ may replace the requirement for Biology 61.103★ and 61.104★. Students who have completed only Biology 61.230★ may replace 61.103★ and 61.104★ with 61.230★ plus a 0.5 credit Biology elective. Students who have completed only 61.209★ must successfully complete 61.103★ and 61.104★; Biology 61.209★ may then be credited as a free elective.

2. For the purposes of calculation, the Major or Honours subjects include all Biochemistry courses, plus the Biology and Chemistry courses fulfilling requirements 1 and 2 in each program.

3. In choosing a program, students should consider the prerequisites required for any courses that they wish to take in later years. In particular, some options may be offered only in alternate years and may require as prerequisites one or other of Biology 61.325★, 61.233★ and 61.335★. Because of timetable constraints, students may have to take Chemistry 65.210 and Biology 61.201★ or 61.202★ in different years.

4. Credit will not be given for Biology 61.220★ or Biochemistry 63.220★ taken after Biochemistry 63.310 or equivalent.

5. "Permission of the Institute" in course prerequisites normally means permission of the Director or the Honours Project coordinator.

6. The following 300-400 level Biology courses are approved to satisfy requirement 1 for Biochemistry students: 61.321★, 61.325★, 61.331★, 61.333★, 61.335★, 61.351★, 61.355★, 61.408★, 61.409★, 61.413★, 61.414★, 61.416★, 61.419★, 61.421★, 61.426★, 61.429★, 61.430★, 61.431★, 61.432★, 61.433★, 61.435 and 61.455.

7. To qualify for graduation with a Major in Biochemistry students must meet the requirements on p. 150 except that they must present 20.0 approved full credits beyond Qualifying-University year and have a grade of C- or better in at least half of the 20.0 credits.

8. Students who wish to take 61.214★ in the Winter term of their first year must obtain a grade of C- or better in 61.103★.

A typical First Year course pattern in a Biochemistry program will be the same as that for Biochemistry and Biotechnology.

Co-op Option for Honours Biochemistry

General information on the Co-op option can be found on p. 39.

Co-operative education formally integrates a student's academic experience with working in industry and/or government. Work opportunities, which are available on a competitive basis, are coordinated to complement a student's course work and interests. Practical work experience provides insights and opportunities for development, and helps prepare an individual for a career in Biochemistry.

Operation of the Co-operative Option

The program is administered by the Co-operative Program Committee which is responsible for securing potential employers, arranging interviews, and managing the program. The details of the program are provided in the Biochemistry Co-op Student Handbook.

Admission Requirements

Students in good standing in the Honours Biochemistry Program may apply for admission to the B.Sc.(Honours) Co-operative option on completion of their first, second or third years. To be eligible for admission, a student must:

1. be registered as a full-time student;
2. have a GPA in Biochemistry of 8.0 or better and an overall GPA of 6.5 or better;
3. be eligible to work in Canada.

A student meeting these requirements is eligible for the Co-op Program but enrollment in the program is limited. Application forms for admission to the Co-operative option are available from the Co-op Office for Engineering and Science. These forms should be completed and returned to the office before May 8, or September 8 or January 8.

The Work/Study Sequence

There are normally three (four month) work terms, but an additional work term will be permitted in exceptional circumstances, e.g. where employment conditions require it. Work terms can occur during the summer after second and third years and during fourth year. Students must have successfully completed 63.220★ or 61.220★ as well as 65.223★ before they can begin their first work term.

Continuation in the Program

To continue in the Co-op option, students must maintain a GPA in Biochemistry of 8.0 or better, and an overall GPA of 6.5 or better.

During work terms, students must be registered in 63.299★, 63.399★ or 63.499★. Successful completion of a work term requires that the student hand in a Work Term Report which is reviewed by the Co-operative program committee and found to merit a "Satisfactory" grade. The requirements for the report and the evaluation criteria are described in the Biochemistry Co-op Student Handbook, which also lists circumstances in which a student may be required to withdraw from the Co-op option. Students must also maintain the Co-op Option academic requirements mentioned above.

Graduation Requirements

Students must complete the 20.0 credits specified for the Biochemistry Honours program, as well as the three work term credits with the appropriate level of grades. Successful completion of these requirements will lead to the award of an Honours degree in Biochemistry with the Co-operative degree designation.

Honours Bachelor of Science in Computational Biochemistry

This program is intended for students who enjoy the challenges of both Biochemistry and Computer Science. e.g. students who wish to enter the field of bioinformatics.

1. 2.5 credits in Biology: 61.103★, 61.214★, 61.314★ and another 1.0 credit at the 100-level or higher;
2. 3.5 credits in Chemistry: 65.100, 65.223★, 65.224★ or 65.226★, 65.211★, 65.233★, 65.353★;
3. 3.5 credits in Biochemistry: 63.220★, 63.305★, 63.310, 63.406★, 68.499;
4. 1.0 credit in Biochemistry at the 400-level or Chemistry 65.446★ and 0.5 credit in Biochemistry at the 400-level;
5. 1.0 credit in Physics: 75.107★ and 75.108★, or 75.101★ and 75.102★;
6. 2.0 credits in Mathematics: 69.107★, 69.117★, 69.207★ and 69.217★;
7. 4.0 credits in Computer Science: 95.102★, 95.105★, 95.106★, 95.185★, 95.202★, 95.204★, 95.304★ or 95.305★, and 95.386★;
8. 2.0 approved arts or social science credits;
9. 0.5 free option credit.

Notes on programs:

1. The 4.0 credits in Computer Science must be completed with a cumulative GPA of 6.5 or better.
2. The GPA in Biochemistry is calculated on the basis of all Biochemistry courses plus the Biology and Chemistry courses in 1 and 2 above.

Major Program

Bachelor of Science in Biochemistry

The Institute of Biochemistry offers a four-year (20.0 credit) program leading to a B.Sc. majoring in Biochemistry and intended to provide a broad basic training for students who have a general interest in biological functions at the molecular level or who are planning a career in biochemistry or a related field of biomedical science that does not demand post-graduate study. Courses in Biology and Chemistry (and resources from these departments) are integrated into the program to provide the background that is fundamental to an understanding of the biochemistry of animals, microorganisms and plants.

Many graduates from the 15-credit B.Sc. programs in Biology or Chemistry may qualify for admission to the final year of the Major B.Sc. in Biochemistry, if they have successfully completed the 300-level Biochemistry courses.

Students entering the program must satisfy the general requirements for a Major B.Sc. The following 20.0 credits are required:

1. 3.5 Biology credits: 61.103 ★, 61.214 ★, 61.314 ★, either 61.201 ★ or 61.202 ★, either 61.325 ★ or 61.335 ★, and 1.0 credit selected from approved 300- or 400-level Biology courses (see Note 6);
2. 4.5 Chemistry credits: 65.100, 65.210 or 65.211 ★ and 65.353 ★, 65.220 or 65.223 ★ and 65.224 ★, 65.233 ★, 65.321 ★, 65.322 ★ or 65.325 ★.
3. (a) Biochemistry 63.220 ★, 63.305 ★, 63.310, 63.401 ★, and
(b) at least 1.0 credit chosen from: Biochemistry 63.402 ★, 63.404 ★, 63.405 ★, 63.406 ★, 63.407 ★, 63.422 ★, 63.432 ★;
4. Physics 75.101 ★ and 75.102 ★, or 75.107 ★ and 75.108 ★, Mathematics 69.107 ★, 69.117 ★ and 69.257 ★;
5. 2.0 approved arts or social science credits;
6. 3.0 credits related to the student's area of interest. Some recommended courses include: Biochemistry listed in 3(b) above, 63.491 ★; Biology courses listed in note 6 above; Chemistry 65.212 ★, 65.311 ★, 65.312 ★, 65.322 ★, 65.325 ★, 65.353 ★, 65.354 ★, 65.370 ★, 65.380 ★, 65.422 ★, 65.423 ★; Physics 75.235 ★, 75.236 ★; Mathematics 69.207 ★, 69.208 ★, 69.217 ★, 69.257 ★; Computer Science 95.107 ★;
7. 1.0 credit free option.

Graduate Program

No graduate program is offered by the Institute but the graduate offerings of the Departments of Biology and Chemistry include projects and courses that may be appropriate for students with an interest in biochemistry. Details are found in the Graduate Studies and Research Calendar.

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Biochemistry 63.220 ★

Cell Physiology and Biochemistry

A lecture and laboratory course on cellular functions and their inter-relationships. It introduces topics including thermodynamics, membrane structure and function, transport mechanisms, basic metabolic pathways, energy production and utilization, communications between cells. (Also listed as Biology 61.220 ★.)

Precludes additional credit for Biology 61.220 ★. Credit will not normally be given for Biochemistry 63.220 ★ or equivalent taken after Biochemistry 63.310.

Prerequisites: Biology 61.103 ★ and or equivalent, Chemistry 65.100 or permission of the Institute.

Lectures three hours a week, laboratory four hours a week.

Biochemistry 63.299 ★

Co-operative Work Term Report 1

This course provides practical experience for students enrolled in the co-operative option. To receive course credit, students must receive a satisfactory evaluation from their work term employer, and present a written report describing their work term project. Graded *Sat/Uns*.

Prerequisites: Registration in the Biochemistry co-operative option and permission of the Institute.

Four month work term.

Biochemistry 63.305 ★

Practical Biochemistry

A laboratory and tutorial course introducing the basics of experimental biochemistry and illustrating the theory and concepts dealt

with in Biochemistry 63.310.

Prerequisites: Chemistry 65.220 or 65.223 ★ and 65.224 ★; Chemistry 65.210 or 65.211 ★ or Biochemistry 63.220 ★/Biology 61.220 ★ with a grade of C- or better, or permission of the Institute. Biochemistry 63.310 or equivalent is recommended as a co-requisite. Laboratory four hours a week plus biweekly assignments.

Biochemistry 63.310

General Biochemistry

Chemistry and metabolism of proteins, lipids, carbohydrates and nucleic acids. Mechanism of action of enzymes. Metabolic control mechanisms and inter-relations. Biological oxidation. Biosynthesis of structural, storage and informational compounds.

Prerequisites: Chemistry 65.220 or 65.223 ★ and 65.224 ★; Chemistry 65.210 or 65.211 ★ or Biochemistry 63.220 ★/Biology 61.220 ★ with a grade of C- or better, or permission of the Institute. A course in genetics is strongly recommended.

Lectures three hours a week.

Biochemistry 63.399 ★

Co-operative Work Term Report 2

This course provides practical experience for students enrolled in the co-operative option. To receive course credit, students must receive a satisfactory evaluation from their work term employer, and present a written report describing their work term project. Graded *Sat/Uns*.

Prerequisites: Registration in the Biochemistry co-operative option and permission of the Institute.

Four month work term.

Biochemistry 63.401 ★

Methods in Biochemistry

The course deals with the principles and applications of modern biochemical methodology, including use of radioisotope tracers, ultracentrifugation, electrophoresis and ion-exchange chromatography.

Prerequisite: Biochemistry 63.305 ★ or permission of the Institute.

Lectures and discussion two hours, laboratory six hours a week.

Biochemistry 63.402 ★

Biomacromolecules

Biochemistry of polysaccharides, proteins and nucleic acids. Discussion of experimental approaches to purification and conformational studies of biomacromolecules, their interaction in solutions, function and regulation of enzymes. Workshop sessions include discussion of experimental design and interpretation, and solving of related numerical problems.

Prerequisite: Biochemistry 63.310 or permission of the Institute.

Lectures two hours, workshop two hours a week.

Biochemistry 63.404 ★

Industrial Biochemistry

A course illustrating the application of biochemistry to the production of biological compounds useful in nutrition, medicine, and the food and chemical industries. The course also reviews the general strategies for efficient production of these compounds by controlling the activities of living cells or enzymes.

Prerequisite: Biochemistry 63.310 or permission of the Institute.

Lectures three hours a week.

Biochemistry 63.405 ★

Biochemical Regulation

A half-credit in biochemical regulation. Topics include regulation at the transcriptional, translational and metabolic level. Regulation of cell and subcellular organelle function and other timely topics may also be included. A detailed course outline is available from the instructor in any given year.

Precludes additional credit for Biochemistry 63.403 ★.

Prerequisite: Biochemistry 63.310.

Lectures three hours a week.

Biochemistry 63.406 ★

Bioinformatics

The use of computers to solve biochemical problems. Topics may include data and software acquisition, sequence analyses, genomics, biomolecular interaction and kinetics, metabolic simulation, molecular modelling of biomolecules and biodiversity.

Prerequisites: Biochemistry 63.310; or permission of the Institute. Lecture one hour a week, computer workshop three hours a week.

Biochemistry 63.407 ★

Membrane Biochemistry

Biochemical and biophysical aspects of biomembrane structure and function. Topics may include: membrane lipids and proteins, lipid polymorphism, model membranes, liposomes, membrane biogenesis, the membrane cytoskeleton, membrane trafficking, membrane fusion, exocytosis and signal transduction across membranes.

Prerequisite: Biology 61.220 ★ or Biochemistry 63.220 ★ or 63.310 (taken concurrently); or permission of the Institute.

Lectures two hours a week and workshop two hours a week.

Biochemistry 63.422 ★

Mutagenesis and DNA Repair

A mechanistic study of mutagenesis and DNA repair. Topics will include DNA structure perturbations, spontaneous and induced mutagenesis, the genetics and biochemistry of DNA repair and recombination, and the role of mutations in the development of genetic disease and cancer. (Also listed as Biology 61.422 ★).

Prerequisites: Biology 61.220 ★ or Biochemistry 63.220 ★ or 63.310 (taken concurrently); Biology 61.314 ★, or permission of the Institute.

Lectures two hours a week and workshop two hours a week.

Biochemistry 63.432 ★

Immunology

The organization and function of the immune system. The anatomy of the immune system, and the molecular and genetic bases of the immune response. The laboratory teaches applications of animal cell culture in studies of immune cells and their products. (Also listed as Biology 61.432 ★.)

Prerequisite: Biology 61.221 ★ or 61.321 ★; or permission of the Institute.

Lectures three hours a week, laboratories four hours a week.

Biochemistry 63.440 ★

The Cell Cycle

A course on the molecular cell biology of the eukaryotic cell cycle. Topics will include regulation of cell proliferation and cell death, and the molecular basis for morphological remodelling during cell division and death. (Also listed as Biology 61.440 ★)

Prerequisites: Biology 61.321 ★, or Biochemistry 63.220 ★ and Biochemistry 63.310.

Biochemistry 63.491 ★

Selected Topics in Biochemistry

Selected topics of current interest in biochemistry are offered upon approval by the Director in consultation with members of the Institute.

Biochemistry 63.497

Honours Essay and Research Proposal

An independent research study using library resources. The candidate will prepare a critical review of a topic approved by a faculty advisor. Evaluation will be based on a report and an oral defence of the report.

Precludes additional credit for Biochemistry 63.498.

Prerequisite: Fourth-year standing in an Honours Biochemistry program and permission of the Institute.

Biochemistry 63.498

Research Project

Students carry out a research project approved by the Director, under the supervision of a faculty member of the Institute, in either the Biology or Chemistry departments. A report must be submitted to the supervisor by the last day of classes, and will be examined by committee.

Precludes additional credit for Biochemistry 63.497.

Prerequisites: Biochemistry 63.305 ★ and 63.310 or equivalent, and eligibility to continue in Honours Biochemistry or in Biochemistry and Biotechnology.

Lectures and associated work average at least eight hours a week.

Biochemistry 63.499 ★

Co-operative Work Term Report 3

This course provides practical experience for students enrolled in the co-operative option. To receive course credit, students must receive a satisfactory evaluation from their work term employer; and present a written report describing their work term project. Graded *Sat/Uns*.

Prerequisites: Registration in the Biochemistry co-operative option and permission of the Institute.

Four month work term.

Biology

(Science/Arts and Social Sciences)

2240 Herzberg Building
Telephone: 520-3515
Fax: 520-2569

Academic Administration

Chair, R.C. Wyndham

Associate Chair (Graduate Studies), J.P. Vierula

Undergraduate Adviser, To be announced

Teaching Staff

Professor Emeriti

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Professors

Margaret E. McCully, M.S.A. (Toronto), Ph.D. (Harvard) F.R.S.C. • **Stewart Peck**, B.S. (Kentucky), M.S. (Northwestern), Ph.D. (Harvard) • **K.B. Storey**, B.Sc. (Calgary), Ph.D. (British Columbia), F.R.S.C. • **P.J. Weatherhead**, B.Sc. (Carleton), M.Sc., Ph.D. (Queen's) • **R.C. Wyndham**, B.Sc. (McMaster), M.Sc. (Guelph), Ph.D. (Calgary)

Associate Professors

George R. Carmody, A.B., Ph.D. (Columbia) • **Nathalie Chaly**, B.Sc., M.Sc. (Carleton), Ph.D. (Laval) • **Lenore Fahrig**, B.Sc. (Queen's), M.Sc. (Carleton), Ph.D. (Toronto) • **Iain B. Lambert**, B.Sc. (Guelph), Ph.D. (McMaster) • **John Sinclair**, B.Sc., Dip. Biophysics (Edinburg), Ph.D. (East Anglia) • **John Vierula**, B.Sc. (York), Ph.D. (Calgary)

Assistant Professors

N. Cappuccino, A.B. (Brown), Ph.D. (Cornell) • **J. Cheetham**, B.Sc., Ph.D. (McMaster) • **Mark R.L. Forbes**, B.Sc. (Acadia), M.Sc. (Western), Ph.D. (Toronto) • **Myron L. Smith**, B.Sc. (Alberta), M.Sc., Ph.D. (Toronto)

Instructors

K.M. Gilmour, B.Sc. (McMaster), Ph.D. (Cambridge) • **Kringen Henein**, B.A., B.Sc., Ph.D. (Carleton) • **M. Runtz**, B.Sc. (Carleton)

Adjunct Research Professors

S.P.J. Brooks, Health Canada • **M.J. Canny** • **R. Forney**, Royal Canadian Mounted Police • **K.E. Freemark**, Canadian Wildlife Service • **D.R. Gardner**, Carleton University • **W.D. Gould**, Natural Resources Canada • **B.F. Johnson** • **L. Lefkovitch**, Agriculture Canada • **B.L.A. Miki**, Agriculture Canada • **P. Mineau**, Canadian Wildlife Service • **V.L. Seligy**, Health Canada • **R. Walker**, National Research Council • **D.M. Wood**, Agriculture Canada • **H. Yamazaki**, Carleton University

General Information

Students intending to major in Biology are strongly advised to acquire a good background in chemistry and physics as well as OAC mathematics or equivalent level.

Undergraduate Programs

The Department of Biology offers both Honours and Major programs leading to either a B.Sc. or a B.A. in Biology. Students enrolled in any of these programs must arrange their courses in consultation with the Undergraduate Adviser, in one of the patterns outlined. None of the courses in the Department of Biology are available by means of Challenge for Credit.

Graduation Regulations

In order to graduate, B.Sc. students must fulfill all University regulations (see p. 48) and all Faculty regulations (see p. 109). B.A. students must fulfill all University regulations (see p. 48) and all Faculty regulations including those relating to First-Year Seminars and Breadth requirements (see p. 63). In addition, all departmental regulations and requirements as set out below must be fulfilled.

For Biology Honours students, the Honours GPA is calculated on the basis of all Biology courses taken by a student during his or her degree program and counted towards the degree. For students in Biology Combined Honours programs, their Honours GPA will

be calculated on the basis of all required credits in the two Honours subjects as stated in the respective program requirements.

For Biology Major students, the Major GPA is calculated on the basis of all biology courses taken by the student during his or her degree program and counted towards the degree. For students in Biology Combined three year programs, their major GPA will be calculated on the basis of all credits counted towards the degree in the two Major subjects.

B.Sc. (Honours) Program

The Honours program in Biology is primarily intended for students planning a professional career in research, teaching or administration in biology, or in one of the fields of applied biology, such as the health sciences, agriculture or environmental science. An Honours degree is usually essential for admission to graduate studies. Students planning such a career are strongly advised to enter the Honours program as early as possible, certainly by the end of the Second year. Students must complete the program shown in the Chart and satisfy the general requirements for Honours stated on p. 146 and take the following 20.0 credits in a pattern approved by the Undergraduate Adviser. (This allows specialization in such biological subdivisions as ecology, behaviour, cell and molecular biology, genetics, microbiology, plant or animal physiology, and systematics.)

1. 7.0 Biology credits to include Biology 61.103★ and 61.104★, 61.201★, 61.202★, 61.214★, 61.220★, 61.260★, one of 61.325★ or 61.335★, 61.491★, 61.498, and 1.5 credits advanced Biology options;
2. Chemistry 65.100; either Physics 75.101★ and 75.102★ or 75.107★ and 75.108★; Mathematics 69.107★ and either 69.117★ or 69.257★, or equivalent;
3. 2.0 Science Continuation credits not in Biology;
4. 1.0 additional credit, chosen in consultation with the Undergraduate Adviser related to the student's area of specialization;
5. 4.0 advanced Science credits, selected in consultation with the Undergraduate Adviser or a faculty member working in the area of specialization chosen by the student;
6. 2.0 approved arts or social science credits;
7. 1.0 free-option credit.

Fourth-year students are strongly urged to attend the departmental research seminars.

Areas of Specialization

Students should choose their advanced Science and Biology option credits at the 300- and 400-level so that they can develop an area of specialization according to their preferred area of biology. Possible areas of specialization include molecular and cellular biology, microbiology, plant and animal physiology, animal behaviour, ecology, and systematics. Note that 400-level courses can be taken by Biology Majors in their Third year of study, provided the appropriate prerequisites are met.

Courses should be chosen in consultation with the Undergraduate Adviser or a faculty member working in an area close to the interest of the student. This consultation should preferably begin before entering the Third year, to ensure that courses that may be given only in alternate years are taken in the correct sequence. In any case, students must consult the Undergraduate Adviser before registering in the Fourth year.

Biology 61.361★ is strongly recommended for students in ecology, animal behaviour and systematics.

Bachelor of Science (Honours) in Computational Biology

The Department of Biology offers a program in Computational Biology that allows students to combine studies in Biology with studies in Computer Science. Students with these combined skills are in high demand in the fields of Bioinformatics, Biotechnology, Ecology and Biodiversity, where large databases are being compiled and used for human genome analysis, drug design, protein engineering, ecosystem management and conservation of biodiversity.

Requirements:

1. 5.5 credits in the Biology core: 61.103★, 61.104★, 61.201★, 61.202★, 61.214★, 61.220★, 61.260★, and 61.325★ or 61.335★, and 61.491★, 68.499;
2. 1.0 credit in Chemistry: 65.100;
3. 1.0 credit in Physics: 75.107★ and 75.108★, or 75.101★ and 75.102★
4. 1.5 credits in Mathematics: 69.107★, 69.117★ and 69.257★
5. 5.0 credits in Computer Science: 95.102★, 95.105★, 95.106★, 95.185★, 95.202★, 95.203★, 95.204★, 95.205★, and 1.0 credits from: 95.285★, 95.304★, 95.305★, 95.307★, 95.308★, 95.384★, 95.386★ or approved Computer Science courses.
6. 4.0 credits of specialization in one of the following areas of Computational Biology:

i) Specialization in Molecular Bioinformatics: 61.314★, 63.310, 63.402★, 63.406★, 61.416★, and 1.0 additional credit above the 200 level in Biology or Biochemistry.

ii) Specialization in Biodiversity: 61.361★, 61.362★, 61.364★, 61.413★, and 61.414★ or 61.469★ and 1.5 additional credit above the 200 level in Biology or 45.207★.

7. 2.0 approved arts or social science credits.

Co-op Option (Honours) in Biology

General information on the Co-op program can be found on p. 39.

Co-operative education formally integrates a student's academic experience with work experience in industry and/or government. Work opportunities, which are available on a competitive basis, are coordinated to complement the student's course work and interests. Practical work experience provides insights and opportunity for development, and helps prepare an individual for a career in Biology.

Operation of the Co-operative Option

The program is administered by the Co-operative Program Committee which is responsible for securing potential employers, arranging interviews, and managing the program. The details of the program are provided in the Biology Co-op Student Handbook.

Admission Requirements

Students in good standing in the Honours Biology program may apply for admission to the B.Sc. (Honours) Co-operative Option, on completion of the First, Second, or Third Year of the B.Sc. (Honours) Biology program. To be eligible for admission, a student must:

1. be registered as a full-time student in the Biology Honours program;
2. have a GPA of 8.0 or better in Biology and an overall GPA of 6.5 or better;
3. be eligible to work in Canada.

Meeting the above requirements will only establish eligibility to enter the program, enrollment in the Co-operative option is limited. Application forms for admission to the Co-operative option are available from the Co-op Office and should be submitted before May 8th, September 8th, or January 8th.

The Work/Study Sequence

There are three four-month work terms. The timing of the employment terms is flexible. Examples include:

- (a) summer employment terms following Years 2, 3, and 4;
- (b) extended summer and fall employment term following year 3 and summer employment following either Year 2 or Year 4

If no suitable job placements can be made, the student will revert to the regular Honours program.

Continuance in the Option

During work terms, students must register in one of three work term courses: 61.299★, 61.399★ or 61.499★; these courses will be graded Sat or Uns. To continue in the option, students must successfully complete their work terms, one of the requirements of which is to hand in a Work Term Report judged to be "Satisfactory". The report requirements and evaluation criteria are described in the Biology Co-op Student Handbook, which also lists all the circumstances in which students may be required to withdraw from the program. In addition, students must maintain the academic standards required for the co-operative education option.

Graduation Requirements

In addition to satisfying the requirements of the Co-operative option as described above, a student must have completed the 20.0 credits specified for the Biology Honours program and three work term courses.

Graduates successfully completing the above requirements will receive a Co-operative degree designation in addition to the Honours designation.

Honours in Biology and Biotechnology

See p. 153.

Combined Honours in Biology and Physical Geography

Program advisers: S.B. Peck (Biology) and C. Burn (Geography).

Students desiring a comprehensive basic education in both biology and physical geography may apply for admission to a Combined Honours B.Sc. program. Applicants must satisfy entry requirements of the Honours B.Sc. program.

Course requirements of the Combined Honours B.Sc. program are 20.0 credits including:

1. Biology 61.103★ and 61.104★; Geography 45.105; Mathematics 69.107★ and either 69.117★ or 69.257★; Chemistry 65.100;
2. 2.0 optional arts or social science credits. 1.0 credit in Geography, other than the Physical Geography courses listed on p. 261, is recommended;
3. 1.0 additional Science credit from the list on p. 110 (either Physics 75.107★ and 75.108★, or 75.101★ and 75.102★ is required unless OAC Physics is presented as an entrance credit);
4. 1.0 free-option credit;
5. 10.0 credits in Biology (or Biochemistry) and Physical Geography (see courses listed on p. 241) beyond First-year level, including at least 0.5 credit involving a field course. Not more than 6.0 credits in this group should be taken in one department and not more than 6.0 may be at the 200-level;
6. 1.0 additional credit in Science or Computer Science above the 100-level, not in Biology or Geography and chosen in consultation with the student's program adviser;
7. Biology 61.498 or Geography 45.496.

Combined Honours in Biology and Geology

Program advisers: S.B. Peck (Biology) and R.T. Patterson (Earth Sciences).

Students desiring a comprehensive basic training in both biology and geology may apply for admission to a Combined Honours program, on completion of the First year of the Science program. Applicants must be of Honours standing and must have achieved grades of C+ or better in both Biology 61.103★, 61.104★, and Geology 67.100.

Course requirements of the Combined Honours program are listed below:

1. Biology 61.103★, 61.104★, Geology 67.100, Mathematics 69.107★ and 69.117★. One of, Chemistry 65.100, either Physics 75.101★ and 75.102★ or 75.107★ and 75.108★. (The omitted subject, i.e. chemistry or physics, must have been taken at the OAC level.)
2. 10.0 credits in Biology (or Biochemistry) and Geology beyond First-year level, including at least 0.5 credit field course. Not more than 6.0 credits in this group should be taken in one department and not more than 6.0 may be at the 200-level.
3. Biology 61.498 or Geology 67.498.
4. 0.5 credit in Statistics (Mathematics 69.257★ is recommended) and 0.5 credit in Computer Science (Computer Science 95.104★ is recommended).
5. 3.0 optional credits, at least 2.0 of which must be acceptable arts or social science credits.
6. 1.0 Science elective credit.
7. A language requirement must be met during the Third year by obtaining a credit in, or demonstrating reading proficiency in one of French, German, Russian, Spanish, Italian, Latin, Greek, or any language acceptable to the program advisers and in which suitable arrangements can be made for the examination.

Bachelor of Science with Honours in Neuroscience

Program advisers: J. Cheetham (Biology) and J. Kelly (Psychology)

Students desiring a comprehensive basic education in the neurosciences may apply for admission to this Combined Honours B.Sc. program. Applicants must satisfy entry requirements of the Honours B.Sc. program.

Recommended Sequence of Courses for Students In Biology B.Sc. Honours and Major programs

First Year - Fall Term

Mathematics 69.107★
Biology 61.103★
Physics 75.107★

First Year - Winter Term

Biology 61.104★
Mathematics 69.117★ or
Mathematics 69.257★
Physics 75.108★

First Year - Fall/Winter Term

Chemistry 65.100
Arts/Social Science Option

Second Year - Fall Term

Plant Biology 61.202★
Cell Physiology 61.220★
Ecology 61.260★

Second Year - Winter Term

Animal Biology 61.201
Genetics 61.214★
Biology Option★

Second Year - Fall/Winter Term

Non-Biology Advanced Science Option
Arts/Social Science Option

Third Year - Fall Term

Animal Physiology 61.335★
/or Biology Option★
Biology Option★

Third Year - Winter Term

Plant Physiology 61.325★
/ or Biology Option★
Biology Option★

Third Year - Fall/Winter Term

Non-Biology Advanced Science Option
Science Option
Free Option

Course requirements of the Combined Honours B.Sc. program are 20.0 credits, as follows:

First Year

Biology 61.103★, 61.104★;
Psychology 49.101★ and 49.102★, or 49.100 as a Social Science elective;
Mathematics 69.107★ and 69.117★;
Chemistry 65.100;
Physics, either 75.101★ and 75.102★, or 75.107★ and 75.108★.

Second Year

Psychology 49.200, 49.220★ and 49.270★;
Biology 61.201★ and 61.220★;
1.0 arts or social science credit other than Psychology;
Chemistry 65.223★ and 65.224★.

Third Year

1.0 credit from Psychology Science Continuation courses;
One of Psychology 49.320 or 49.370 Honours Seminars;
Mathematics 69.257★ and 69.259★ (Psychology 49.300 may be substituted);
Biology 61.214★ and 61.335★;
1.0 Biology or Biochemistry option.

Fourth Year

Psychology 49.497 or Biology 61.498 in neurophysiology, animal behaviour, neuropsychology or a related topic;
1.0 credit from Psychology Science Continuation courses;
Biology 61.436★ or equivalent;
1.5 advanced credit in Biology or Biochemistry;
1.0 free-option credit.

B.Sc. (Major) Program

The Bachelor of Science program in Biology recognizes the strong dependence of most modern biology on the physical sciences and mathematics. It treats biology as a unified subject based on common principles and qualities expressed in diverse ways by different organisms. The Major program is not primarily regarded as professional preparation by itself, but its aim is to provide a strong base in concepts and basic facts which should be adaptable to changing demands and needs in modern society. Students enrolled for a Bachelor of Science degree with a Major in Biology must satisfy the general requirements for Science stated on p. 107 and take the following 15.0 credits in a pattern approved by the Undergraduate Adviser.

The recommended course pattern is shown in the Chart on p. 146. It is important that students enrol in courses in the recommended sequence to ensure that subsequent prerequisites are met. The program can be summarized as follows:

1. 6.0 Biology credits to include Biology 61.103★ and 61.104★, 61.201★, 61.202★, 61.214★, 61.220★, 61.260★, one of 61.325★ or 61.335★, 2.0 credits advanced Biology options;
2. Chemistry 65.100; either Physics 75.101★ and 75.102★, or Physics 75.107★ and 75.108★; Mathematics 69.107★ and either 69.117★ or 69.257★ or equivalent;
3. 2.0 Science Continuation credits not in Biology;
4. 1.0 additional Science credit;
5. 2.0 approved arts or social science credits;
6. 1.0 free-option credit.

B.A. Programs in Biology

The Department of Biology also offers B.A.(Honours) and B.A. degrees in Biology alone or the B.A.(Honours)combined with other programs in the Faculties of Arts and Social Sciences and Public Affairs and Management. The B.A. in Biology places less emphasis on support from the physical sciences, but allows students to relate

their knowledge of biology to other disciplines in the arts or social sciences in a three-year program. The B.A.(Honours) program allows the development of particular interests in depth and initiates the student into research in the field, laboratory or library. Generally, the Honours degree is a prerequisite for admission to graduate programs and is an advantage for those planning a professional career in teaching or administration in biology, including the health sciences, agriculture and environmental science.

The Combined B.A.(Honours) program allows the simultaneous specialization in Biology and one of the arts or social sciences. Because of the social and cultural impact of science and technology, interdisciplinary combinations such as Biology and Economics, Geography, History, Journalism, Law, Philosophy, Political Science, Psychology, Religion or Sociology-Anthropology should better qualify one to grapple with demography, biogeography and the environment and legal implications of pollution and biomedical engineering, science policy, comparative psychology, social evolution, and the historical, philosophical and spiritual implications of current biological knowledge.

It is desirable to enter an Honours program as soon as possible, to ensure that the sequence of selected courses will conform to degree requirements. (See p. 70). Students pursuing the programs must arrange their courses in consultation with the Undergraduate Adviser of the department or departments according to one of the patterns outlined below.

In accordance with the regulations of the B.A. program (p. 70), B.A. (Honours) Biology students must have a minimum of 8.0 Biology credits, and can offer a maximum of 12.0 Biology credits counting towards the 20.0 required credits for the B.A. (Honours) degree. B.A. Biology students must have a minimum of 6.0 Biology credits, and can offer a maximum of 8.0 Biology credits counting towards the 15.0 credits required for the B.A. degree.

B.A. (Honours) Biology

20.0 credits to include:

1. 8.0 Biology credits to include Biology 61.103★, 61.104★, 61.201★, 61.202★, 61.214★, 61.220★, 61.260★, one of 61.325★ or 61.335★, 3.0 additional Biology credits (at least 1.0 credit at the 400 level);
2. Chemistry 65.100;
3. 2.0 additional Science credits not in Biology, including one at the 200-level or above;
4. 6.0 arts or social science credits including at least 2.0 at the 200-level or above;
5. 1.0 credit at the 300- or 400-level approved by the Undergraduate Adviser;
6. 1.0 additional credit;
7. An Honours project (Biology 61.497 or 61.498).

Combined B.A. (Honours) Biology

20.0 credits to include:

1. 6.0 Biology credits to include Biology 61.103★, 61.104★, 61.201★, 61.202★, 61.214★, 61.220★, 61.260★, 2.5 additional Biology credits (at least 1.0 credit at the 400-level);
2. Chemistry 65.100;
3. 2.0 additional Science credits not in Biology, including one at the 200-level or above;
4. At least 7.0 arts or social science credits to include at least 6.0 credits from another department as a requirement for the combined B.A. (Honours) program;
5. An Honours project (Biology 61.497 or 61.498, or equivalent

from the student's other Honours department);

6. 3.0 additional credits.

B.A. Biology

15.0 credits to include:

1. 6.0 Biology credits: Biology 61.103★, 61.104★, 61.201★, 61.202★, 61.214★, 61.220★, 61.260★, 2.5 additional Biology credits;
2. Chemistry 65.100;
3. 1.0 additional Science credit not in Biology;
4. At least 4.0 arts and social science credits;
5. 3.0 additional credits, one of which must be at the 200-level or above.

Notes on Programs

1. Students who have completed a credit for either Biology 61.100, 61.101 or 61.102, or the combination of 61.209★ with 61.230★, will be able to use this credit to replace Biology 61.103★ and 61.104★.

Students who have completed only Biology 61.230★, will be able to replace Biology 61.103★.

Students who have completed only Biology 61.209★, must take Biology 61.103★ and 61.104★ before taking advanced Biology courses with laboratories. Biology 61.209★ will then be credited as a Biology elective.

Students who have completed Biology 61.102 and 61.209★ (or 61.230★), will be able to replace Biology 61.103★, 61.104★ with 61.209★ (or 61.230★), plus an additional half credit Biology elective. Biology 61.102 will be credited as an 'additional science' course.

Students who have completed Biology 61.102, 61.209★ and 61.230★, will be able to replace Biology 61.103★, 61.104★ with 61.209★ and 61.230★. Biology 61.102 will be credited as an 'additional science' course.

2. It is important to take Biology 61.220★ in Second year; it is a critical prerequisite for other courses.

3. Students are strongly advised to register in Chemistry 65.100 in their First year, providing they have the OAC, or equivalent, in Chemistry. Students entering without the OAC Chemistry, or equivalent, should register in Chemistry 65.010 in their First year and Chemistry 65.100 no later than their Second year. This early registration in Chemistry is emphasized because Chemistry 65.100 is a prerequisite for Biology 61.220★.

4. Students who have taken Mathematics 69.106★ may use it as a free option or a 100-level Science option.

5. It is recommended that students obtain advice from the Undergraduate Adviser on which Mathematics option (69.117★ or 69.257★) is best suited to their future plans.

6. In choosing Science Continuation courses not in Biology, students may select from the Science Continuation courses listed on p. 111. Suggested courses include Biochemistry 63.310, 63.305★, 63.401★, 63.402★, 63.404★, 63.406★, 63.407★; Chemistry 65.211★, 65.212★, 65.223★, 65.224★, 65.321★, 65.322★; Geology 67.231★, 67.236★; Mathematics 69.257★; Computer Science 95.107★, 95.108★; Geography 45.210; Psychology 49.220★, 49.270★. In addition, Mathematics 69.207★, 69.208★, Physics 75.291★, 75.292★ are suggested for some students.

7. Biology Major and Honours students (except students in the B.A., B.A. (Honours) and Combined B.A. (Honours) programs) may use Technology, Society, Environment 59.300, 59.401★ or 59.402★ in fulfilling the degree requirements, but only as a free option.

If the department cannot find a supervisor for a student who has applied to register for Biology 61.498, then Biology 61.497 will be accepted as a replacement. Under such an exceptional circumstance the Department Chair will direct a student to replace Biology 61.498 with Biology 61.497.

Graduate Program

The Department of Biology offers programs of study and research leading to M.Sc. and Ph.D. degrees in molecular and cellular biology, microbiology, plant and animal physiology, ecology and systematics. Details will be found in the Graduate Studies and Research Calendar.

Requirement for Breadth, B.A. and B.A.(Honours) degrees

Category for Breadth	Courses in this unit
The temporal dimension of human societies, analyzing times before the present era or societies other than our own	
The artifacts of the imagination in literature and/or other forms, or that addresses the life of the imagination and culture.	
The understanding of social, technological and/or natural processes and the ways in which that understanding is obtained in science and social science.	All courses in Biology
Matters of human values, ethics and social responsibilities	

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Notes: More detailed information regarding Biology courses taken in Second and later years, and topics for Honours research projects (61.498), may be obtained from *Outlines of Advanced Biology and Biochemistry courses to be offered in the Fall/Winter Session 1999-2000* and *Suggested Topics for Biology 61.498 Research Projects 1999-2000*. These information booklets may be obtained from the College of Natural Science Administrative Office. All students are strongly advised to consult these information booklets when planning their future course patterns.

Students should note that Biology 61.103★ and 61.104★ are intended primarily for students wishing to major in Biology or take a Science degree. Other students who wish to take Biology courses should consider Biology 61.192★, 61.193★ and/or 61.216★.

Biology 61.103★

Introductory Biology I

A lecture and laboratory course focusing on the cell. The course emphasizes the organization of cells, cellular metabolism, classical and molecular genetics and the reproduction of cells and organisms.

Precludes additional credit for Biology 61.100, 61.102, or the combination of 61.209★ and 61.230★.

Prerequisite: OAC Biology (or equivalent), or OAC Chemistry (or equivalent), or Chemistry 65.010.

Lectures three hours a week, laboratory and/or tutorial three hours a week.

Biology 61.104 ★

Introductory Biology II

A lecture and laboratory course focusing on organisms and populations. The course emphasizes diversity of life forms, evolution and ecology.

Precludes additional credit for Biology 61.100, 61.102, or the combination of 61.209 ★ and 61.230 ★.

Prerequisite: Biology 61.103 ★ or equivalent.

Lectures three hours a week, laboratory and/or tutorial three hours a week.

Biology 61.192 ★

Natural History

A course designed primarily for students in non-Biology programs to investigate the natural history of plants and animals, and the communities in which they occur. Particular attention is paid to the Ottawa region, but appropriate examples from other locales are also included. This course is acceptable only as a Free Elective in all Science programs and B.A. Biology programs.

Lectures three hours a week.

Biology 61.193 ★

The Natural History of Ontario

A study of Ontario's biodiversity. In addition to examining the makeup of the different communities of plants and animals found in Ontario, the course explores their adaptations to the forces that influence their distribution. This course is acceptable only as a Free Elective in all Science programs and B.A. Biology programs.

Prerequisite: Biology 61.192 ★.

Lectures three hours a week.

Biology 61.201 ★

Animals: Form and Function

An investigation of invertebrates and vertebrates to relate their structure, function, behaviour and interactions with plants.

Precludes additional credit for Biology 61.200.

Prerequisites: Biology 61.103 ★ and 61.104 ★ or permission of the Department.

Lectures three hours a week, laboratory four hours a week.

Biology 61.202 ★

Plants: Form and Function

An introduction to the structure and development of higher plants (at molecular, cellular and organism levels) discussed in relation to their function.

Precludes additional credit for Biology 61.200.

Prerequisites: Biology 61.103 ★ and 61.104 ★ or permission of the Department.

Lectures three hours a week, laboratory and/or tutorial three hours a week.

Biology 61.214 ★

Introductory Genetics

A lecture and laboratory course on the mechanisms of inheritance and the nature of gene structure, composition and function. It introduces both classical Mendelian genetics and modern molecular genetics.

Precludes additional credit for Biology 61.215. Credit for Biology 61.216 ★ will only be given if taken before Biology 61.214 ★.

Prerequisites: Biology 61.103 ★ and 61.104 ★ or permission of the Department.

Lectures three hours a week, laboratory and/or tutorial three hours a week.

It is strongly recommended that this course be taken by Biology Majors in their Second year of study (see Chart, p. 146).

Biology 61.216 ★

Human Genetics and Evolution

Designed for students interested in learning about the genetic mechanisms involved in human development (embryogenesis, reproduction and aging), diseases, cancer, behaviour, environmental adaptation and evolution.

Not a Science continuation course. Available to students in a Biology or other Science program only as free elective, but credit will be given for Biology 61.216 ★ only if taken before 61.214 ★ or 61.215.

Prerequisite: A general biology course at the OAC level or equivalent.

Lectures three hours a week.

Biology 61.220 ★

Cell Physiology and Biochemistry

A lecture and laboratory course on cellular functions and their inter-relationships. It introduces topics including thermodynamics, membrane structure and function, transport mechanisms, basic metabolic pathways, energy production and utilization, communications between cells.

(Listed as Biochemistry 63.220 ★ for students enrolled in the Biochemistry and Biochemistry/Biotechnology programs.)

Prerequisites: Biology 61.103 ★ and 61.104 ★, Chemistry 65.100 or permission of the Department.

Lectures three hours a week, laboratory four hours a week.

It is strongly recommended that this course be taken by Biology Majors and Honours students in their Second year of study. (See Chart, p. 146.)

Biology 61.233 ★

Microbiology

The biology of the Bacteria, Archaea, Viruses and Protozoans, from the fundamentals of cell chemistry, molecular biology, structure and function, to their involvement in ecological and industrial processes and human disease.

Precludes additional credit for Biology 61.331 ★.

Prerequisite: Biology 61.103 ★ or Chemistry 65.100 ★ or Chemistry 65.111 ★.

Lectures three hours a week.

Biology 61.260 ★

Introduction to Ecology

How the physical and biotic environments affect the distribution, abundance and evolution of life, and the importance of ecological ideas in improving understanding of our impact on the environment. The laboratory includes field and computer exercises.

Precludes additional credit for Biology 61.360 ★ and 61.261 ★.

Prerequisites: Biology 61.103 ★ and 61.104 ★ or 61.100, or permission of the Department.

Lectures three hours a week, laboratory and/or tutorial three hours a week.

Biology 61.299 ★

Co-operative Work Term Report

Practical experience for students enrolled in the Co-operative Option. To receive course credit students must receive satisfactory evaluations from their work term employer. Written reports describing the work term project will be required. Graded *Sat* or *Uns*.

Prerequisites: Registration in the Biology Co-operative Option and permission of the Department.

Four-month work term.

Biology 61.304 ★

Insect Diversity

An introductory field, laboratory, seminar and lecture course on sampling, identification, diversity and biology of insects. Designed

for anyone who will use insects in any teaching, research or natural history capacity.

Precludes additional credit for Biology 61.461.

Prerequisites: Biology 61.201 ★.

Lectures two hours a week, laboratory four hours a week.

Biology 61.311 ★

Mycology

The morphology, evolution and biological importance of the fungi.

Prerequisites: Biology 61.103 ★ and 61.104 ★.

Lectures two hours a week, laboratory four hours a week.

Biology 61.314 ★

Molecular Genetics

A lecture course dealing with modern advances in molecular genetics.

Precludes additional credit for Biology 61.215.

Prerequisite: Biology 61.214 ★ or permission of the Department.

Lectures three hours a week.

Biology 61.321 ★

Cell Biology

A lecture and laboratory course on the structure, composition, function and development of eukaryotic cells and their organelles.

Precludes additional credit for Biology 61.221 ★.

Prerequisites: Biology 61.214 ★, 61.220 ★, 61.314 ★, or permission of the Department.

Lectures three hours a week, laboratory four hours a week.

Biology 61.325 ★

Plant Biochemistry and Physiology

A lecture and laboratory course consisting of selected topics in metabolism and physiology of plants, including photosynthesis, nutrient uptake and transport, intermediary and secondary metabolism, germination, growth and development.

Prerequisites: Biology 61.202 ★ and either Biology 61.220 ★ or Chemistry 65.220; or permission of the Department.

Lectures three hours a week, laboratory four hours a week.

Biology 61.333 ★

Experimental Microbiology

Intensive training in laboratory techniques in microbiology, using bacteria and other microorganisms to demonstrate processes of cell growth, metabolism, gene expression, rapid evolution, gene transfer, microbial community dynamics and interactions with other organisms.

Precludes additional credit for Biology 61.331 ★.

Prerequisites: Biology 61.220 ★ and 61.233 ★, or permission of the Department.

Laboratory five hours a week.

Biology 61.335 ★

Animal Physiology

The properties of physiological systems and components of animals with emphasis on their physico-chemical bases.

Prerequisites: Biology 61.220 ★ or Chemistry 65.210. Physics 75.105, or 75.101 ★ and 75.102 ★ and Mathematics 69.107 ★ and 69.117 ★ or 69.257 ★ are strongly recommended.

Lectures three hours a week, laboratory four hours a week.

Biology 61.351 ★

The Biophysics of Animal Movement

Topics include the properties of muscles, tendons, bones, joints and the co-ordinated use of these structures. Human locomotion and fitness, bird flight, especially the soaring of the vulture and the albatross, and animal migration are covered in detail.

Prerequisites: Biology 61.220 ★ or Chemistry 65.211 ★ and Physics 75.101 ★ and 75.102 ★ or 75.107 ★ and 75.108 ★ or permission of the Department.

Lectures three hours a week, tutorial or seminar one hour a week.

Biology 61.361 ★

Ecosystem Ecology

A course utilizing the concepts presented in Biology 61.260 ★ and selected ecological experiments to analyze ecosystem types and the major factors that characterize them.

Prerequisite: Biology 61.260 ★.

Lectures three hours a week, laboratory four hours a week.

Biology 61.362 ★

Conservation Biology

The science of biology as applied to the problem of maintaining species diversity. Topics include: history of conservation biology, valuation of species, indices of biodiversity, extinction, conservation genetics, conservation planning in parks and reserves, landscape ecology and case studies of conservation problems.

Prerequisite: Biology 61.260 ★ or permission of the Department. Lectures three hours a week and laboratory/workshop three hours a week.

Biology 61.364 ★

Analysis of Ecological Relationships

Introduction to the analysis of ecological data. Students analyse real ecological data sets in weekly laboratory sessions. Methods introduced include simple linear, polynomial, and multiple regression analysis, analysis of variance, nonparametric tests, tests of independence and logistic regression analysis.

Prerequisites: Biology 61.260 ★ and Mathematics 69.257 ★. For students in the Environmental Engineering program, Engineering 81.202, 81.302 ★, and Mathematics 69.352 ★, which may be taken concurrently.

Workshops four hours a week.

Biology 61.365 ★

Field Course I

An intensive study of living organisms under natural conditions. Credit is based on two weeks of full-time field work with attendant assignments. A wide range of modules is available. Transportation and room and board costs are borne by the student. (Also listed as Psychology 49.323 ★, for animal behaviour modules only.) Students make take both 61.365 ★ and 61.366 ★ for credit, but neither may be used to repeat a particular module.

Prerequisites: At least one course in Biology beyond the 100-level and written permission of the Department.

All day, approximately six days a week.

Biology 61.366 ★

Field Course II

An intensive study of living organisms under natural conditions. Credit is based on two weeks of full-time field work with attendant assignments. A wide range of modules is available. Transportation and room and board costs are borne by the student. Students may take both Biology 61.365 ★ and 61.366 ★ for credit, but neither can be used to repeat a particular module.

Prerequisites: At least one course in Biology beyond the 100-level and written permission of the Department.

All day, approximately six days a week.

Biology 61.381 ★

Plants and Herbivores

This course explores the chemical, physiological, ecological and evolutionary interactions that underlie the relationship between plants and their insect herbivores.

Prerequisites: Biology 61.201 ★ and 61.202 ★.

Lectures/seminars three hours a week.

Biology 61.382 ★

Animal Behaviour

Advanced study of animal behaviour. Topics such as predator-prey interactions, mating behaviour, migration, mother-young interactions and social behaviour interpreted in an ecological context. Precludes additional credit for Biology 61.481 ★.

Prerequisites: Biology 61.201 ★, and 61.260 ★ (may be taken concurrently), or permission of the Department.
Lectures two hours a week, laboratory four hours a week.

Biology 61.391 ★

Biology in Society

A seminar course dealing with selected areas of biological knowledge with direct relevance to social activities of man. Not available as a Science continuation course for students other than Biology Majors except with permission of the student's Major department.
Prerequisites: Biology 61.201 ★, 61.202 ★, 61.214 ★ or permission of the Department.

Lectures/seminars/discussions, three hours a week.

Biology 61.399 ★

Co-operative Work Term Report

Practical experience for students enrolled in the Co-operative Option. To receive course credit students must receive satisfactory evaluations from their work term employer. Written reports describing the work term project will be required. Graded *Sat* or *Uns*.

Prerequisites: Registration in the Biology Co-operative Option and permission of the Department.

Four-month work term.

Biology 61.408 ★

Plant Development

A lecture course dealing with recent advances in our understanding of plant development.

Precludes additional credit for Biology 61.410.

Prerequisite: Biology 61.202 ★ or permission of the Department.

Lectures and seminars, three hours a week.

Biology 61.409 ★

Techniques for the Experimental Study of Plant Structure

A practical course in which students have the opportunity to learn and evaluate modern techniques used in the study of plant structure by optical microscopy.

Precludes additional credit for Biology 61.410.

Prerequisite: Biology 61.202 ★ or permission of the Department.

Laboratory five hours a week.

Biology 61.412 ★

Molecular Ecology

The interface of molecular biology, ecology and population biology. Topics include experimental design and a survey and critique of molecular genetic methods to study ecology.

Prerequisite: Biology 61.214 ★ and 61.260 ★; 61.314 ★ or one of 61.361 ★, 61.362 ★ (may also be taken concurrently); or permission of the Department.

Biology 61.413 ★

Population Genetics

Basic ideas of population structure, equilibrium, selection mutation, genetic drift.

Precludes additional credit for Biology 61.418.

Prerequisite: Biology 61.214 ★ or permission of the Department.

A course in statistics is highly recommended.

Lectures and seminars three hours a week.

Biology 61.414 ★

Evolutionary Genetics

A continuation of Biology 61.413 ★ dealing with molecular evidence of evolution, speciation as well as the analysis of biometrical traits.

Precludes additional credit for Biology 61.418.

Prerequisite: Biology 61.413 ★ or permission of the Department.

A course in statistics is highly recommended.

Lectures and seminars three hours a week.

Biology 61.416 ★

Methods in Molecular Genetics

The scope and purpose of the course is to review the use of inno-

vative genetic manipulation techniques for the successful solution of problems in molecular biology. The course is suitable for students with a developing interest in problems of molecular and cellular biology and biochemistry.

Prerequisites: Biology 61.214 ★ and 61.314 ★ or 61.215 and 61.233 ★ or 61.331 ★ or equivalent and a course in Biochemistry or permission of the Department.

Lectures two hours a week.

Biology 61.419 ★

Laboratory Techniques in Molecular Genetics

This laboratory course is complementary to Biology 61.416 ★. It is designed to give the student some practical familiarity with methodology in molecular genetic techniques. The laboratory is suitable for students with a developing interest in problems of molecular and cellular biology and biochemistry.

Precludes additional credit for Biology 61.417.

Prerequisites: Biology 61.233 ★ or 61.331 ★ and 61.416 ★ or equivalent and a course in Biochemistry or permission of the Department. Enrolment limited.

Lecture/laboratory six hours a week in two sessions.

Biology 61.422 ★

Mutagenesis and DNA Repair

A molecular study of mutagenesis and DNA repair. Topics will include DNA structure perturbations, spontaneous and induced mutagenesis, the genetics and biochemistry of DNA repair and recombination, and the role of mutagens in the development of genetic disease and cancer. (Also listed as Biochemistry 63.422 ★.)

Prerequisites: Biology 61.220 ★ (or 63.310 taken concurrently) or 61.314 ★; or permission of the Department.

Lectures two hours a week and workshop two hours a week.

Biology 61.424 ★

Plant Physiological Ecology

Physiological mechanisms for the acquisition of carbon, water and nutrients in plants adapted to a variety of environments. Particular emphasis on studying mechanisms for acclimation/adaptation to variation in environmental conditions.

Prerequisites: Biology 61.202 ★, Biology 61.325 ★, or permission of the Department.

Lectures and seminars three hours a week.

Biology 61.429 ★

Advanced Plant Physiology

An advanced course dealing with recent developments in selected topics of plant physiology.

Precludes additional credit for Biology 61.425.

Prerequisites: Biology 61.325 ★ and Chemistry 65.223 ★, 65.224 ★ or permission of the Department.

Lectures/discussion three hours a week.

Biology 61.430 ★

Applied and Environmental Microbiology

Studies of microbial ecology, physiology, biochemistry and genetics as they apply to microorganisms and microbial communities functioning in natural, agricultural and industrial environments.

Prerequisites: Biology 61.233 ★ or 61.331 ★ or Biochemistry 63.310; or permission of the Department.

Lectures and tutorial three hours a week.

Biology 61.431 ★

Current Topics in Biotechnology

Explorations of developing biotechnologies in areas such as microbial products, protein engineering, plant genetic engineering, environmental remediation, pharmaceuticals production and medical diagnostics and therapy.

Prerequisites: Biology 61.233 ★ or 61.331 ★ or Biochemistry 63.310 or permission of the Department.

Lectures and tutorials three hours a week.

Biology 61.432 ★

Immunology

The organization and function of the immune system. The anatomy of the immune system, and the molecular and genetic bases of the immune response. The laboratory deals with applications of animal cell culture in studies of immune cells and their products. (Also listed as Biochemistry 63.432 ★.)

Prerequisites: Biology 61.221 ★ or 61.321 ★; or permission of the Department.

Lectures three hours a week, laboratory four hours a week.

Biology 61.436 ★

Animal Physiology

A course dealing with recent advances made in particular areas of animal physiology.

Precludes additional credit for Biology 61.435.

Prerequisites: Biology 61.335 ★, Chemistry 65.223 ★ and 65.224 ★, and Physics 75.107 ★ and 75.108 ★, or 75.101 ★ and 75.102 ★, or permission of the Department.

Lectures two hours a week, workshops or laboratory four hours a week.

Biology 61.440 ★

The Cell Cycle

A course on the molecular cell biology of the eukaryotic cell cycle. Topics will include regulation of cell proliferation and cell death, and the molecular basis for morphological remodelling during cell division and death. (Also listed as Biochemistry 63.440 ★.)

Prerequisites: Biology 61.321 ★, or both Biochemistry 63.220 ★ and 63.310.

Biology 61.463 ★

Insect Evolution and Biology

Major questions on the origin, evolution and adaptation of structures and physiology of terrestrial arthropods, especially insects.

Precludes additional credit for Biology 61.460.

Prerequisite: Biology 61.304 ★, or permission of the Department.

Lectures two hours a week, laboratory four hours a week.

Biology 61.469 ★

Evolutionary Concepts

Evolution as related to gene pools, isolation, speciation, natural selection, competition, dominance, and distributional patterns; examples from North American biota are emphasized.

Prerequisites: Biology 61.260 ★ or permission of the Department.

Lectures two hours a week, laboratory four hours a week.

Biology 61.482 ★

Advanced Animal Behavior

Contemporary issues in behavioral ecology. Issues could include the relevance of behavioral ecology to conservation biology, to new insights into human social behavior, and will be selected through consultation between professor and students.

Prerequisites: Biology 61.382 ★ or permission of the Department.

Lectures two hours a week, laboratory four hours a week.

Biology 61.490

Directed Special Studies and Seminar

Permission of the Department.

Biology 61.491 ★

Directed Special Studies

Independent or group study, open to Third and Fourth year students to explore a particular topic, in consultation with a Faculty supervisor. May include directed reading, written assignments, tutorials, laboratory or field work.

Prerequisite: Permission of the Department. Students normally may not offer more than a total of 1.0 credit of Directed Special Studies in their program.

Biology 61.497

Honours Essay and Research Proposal

An independent research study using library resources. The candidate prepares a critical review and research proposal of a topic approved in consultation with a Faculty advisor. Evaluation will be based on these written submissions and an oral defence.

Precludes additional credit for Biology 61.498.

Prerequisite: Fourth-year standing in an Honours Biology program and permission of the Department.

Biology 61.498

Honours Research Thesis

An independent research project undertaken in the field and/or the laboratory, under the direct supervision of a Faculty adviser. The candidate prepares a written thesis and is orally examined by a faculty committee after the thesis has been presented for examination.

Precludes additional credit for Biology 61.497.

Prerequisites: Biology 61.491 ★ (may be taken concurrently), and permission of the Department. Open only to B.Sc. Honours students, and B.A. Biology Honours students (depending on their laboratory experience and with permission from the Chair of the Department, in their Fourth year.

Biology 61.499

Co-operative Work Term Report

Practical experience for students enrolled in the Co-operative Option To receive course credit students must receive satisfactory evaluations from their work term employer. Written reports describing the work term project will be required. Graded *Sat* or *Uns*.

Prerequisites: Registration in the Biology Co-operative Option and permission of the Department.

Four-month work term.

Biotechnology (Science)

2240 Herzberg Building
Telephone: 520-3515
Fax: 520-2569

Academic Administration

Biotechnology Co-ordinators,
Biology: R.C. Wyndham • **Biochemistry:** J. Sinclair

General Information

Biotechnology is concerned with the design, modification and controlled use of living organisms and their metabolic systems to carry out a wide range of useful processes in agriculture, manufacturing and service industries. This is an important and growing field for the application of biological studies to industrial, commercial, agricultural and environmental problems. Important areas include fermentation and enzyme technology, genetic engineering and other cellular manipulations.

Biotechnology at Carleton

A number of scientists at Carleton carry out research in topics related to biotechnology. Some areas currently under investigation include:

- * metabolic engineering and applied microbiology;
- * genetic engineering;
- * natural products for biological control;
- * cell and tissue culture technology.

By completing a particular pattern of options in Biology or Biochemistry, undergraduates interested in careers in this expanding area can qualify for an Honours B.Sc. in Biology and Biotechnology, or in Biochemistry and Biotechnology. These programs provide the basic grounding in biology and chemistry, yet allow inclusion of specialized courses related to biotechnology. The biology version allows for more emphasis at the cell and organismal levels, while the biochemistry version has a greater concentration at the molecular level. One of the requirements is completion of an Honours research project in a topic related to current studies in biotechnology. In special cases, students may carry out the project in a local laboratory outside of the University, with joint supervision by a faculty member and an outside scientist. When possible, special courses will be offered in subjects of direct application in biotechnology.

Courses required for the Biotechnology designation (in addition to other program requirements) include: Organic Chemistry (Chemistry 65.223 ★ and 65.224 ★), General and Industrial Biochemistry (Biochemistry 63.305 ★, 63.310, 63.404 ★), Cell Biology (Biology 61.321 ★), Microbiology (Biology 61.233 ★), Molecular Genetics and/or Cell Biology (selected from Biology 61.416 ★, 61.419 ★, 61.421 ★, 61.432 ★) and Biotechnology (Biology 61.430 ★ or 61.431 ★).

For information on course patterns, students entering these programs with, or without, the OAC in Biology should refer to p. 148 for complete information.

Honours in Biology and Biotechnology

Course requirements are 20.0 credits, in a pattern approved by the appropriate Biotechnology Co-ordinator:

1. 8.0 Biology credits: Biology 61.103 ★ and 61.104 ★, 61.201 ★, 61.202 ★, 61.214 ★, 61.220 ★, 61.233 ★, 61.314 ★, 61.321 ★, either 61.325 ★ or 61.335 ★, one of 61.430 ★ or 61.431 ★; 1.0 credit from 61.416 ★, 61.419 ★, 61.421 ★, or 61.432 ★; 61.491 ★; 1.5 credits Biology option.
2. 2.0 Biochemistry credits: Biochemistry 63.310, 63.305 ★, 63.404 ★.
3. 2.0 Chemistry credits: Chemistry 65.100, 65.223 ★ and 65.224 ★.
4. 1.0 Physics credit: Physics 75.101 ★ and 75.102 ★, or 75.107 ★ and 75.108 ★.
5. 1.5 Mathematics credits: Mathematics 69.107 ★, 69.117 ★, 69.257 ★.
6. 1.5 credits to be chosen from Biology 61.311 ★, 61.333 ★, 61.416 ★, 61.419 ★, 61.421 ★, 61.422 ★, 61.430 ★, 61.431 ★, 61.432 ★; Biochemistry 63.401 ★, 63.402 ★, Chemistry 65.211 ★, 65.370 ★, 65.380 ★, Technology, Society, Environment 59.401 ★, and 59.402 ★. In special cases, other advanced Science courses may be approved by the Biotechnology Co-ordinator.
7. 2.0 approved arts or social science credits.
8. 1.0 free option credit.
9. A research project (Biology 61.498) in an area approved by the Biotechnology Co-ordinator.

Honours in Biochemistry and Biotechnology

Course requirements are 20.0 credits, in a pattern approved by the appropriate Biotechnology Co-ordinator:

1. 4.5 Biology credits: 61.103 ★, 61.201 ★ or 61.202 ★, 61.214 ★, 61.314 ★, 61.233 ★ or 61.331 ★, 61.321 ★, either 61.325 ★ or 61.335 ★, and 1.0 credit chosen from 61.416 ★, 61.419 ★, 61.421 ★, 61.430 ★ and 61.431 ★.
2. 4.5 Biochemistry credits: 63.220 ★ or the equivalent, 63.305 ★, 63.310, 63.401 ★, 63.497 or 63.498 and 1.0 credit chosen from 63.402 ★, 63.404 ★, 63.405 ★, 63.406 ★, 63.407 ★, 63.422 ★, 63.432 ★, 63.440 ★.
3. 4.5 Chemistry credits: 65.100, 65.211 ★, 65.223 ★, 65.224 ★, 65.233 ★, 65.321 ★, either 65.322 ★ or 65.325 ★, and 65.353 ★.
4. 1.0 Physics credit: 75.101 ★ and 75.102 ★, or 75.107 ★ and 75.108 ★.
5. 1.5 Mathematics credits: 69.107 ★, 69.117 ★, and 69.257 ★.
6. 1.0 credit chosen from the Biochemistry courses listed in 2. above, Biology 61.201 ★, 61.202 ★, 61.325 ★, 61.335 ★, 61.416 ★, 61.419 ★, 61.421 ★, 61.429 ★, 61.430 ★, 61.431 ★, Chemistry 65.212 ★, 65.322 ★, 65.325 ★, 65.370 ★, 65.380 ★. In special cases, other advanced Science courses may be approved by the Director.
7. 2.0 approved arts or social science credits.
8. 1.0 free-option credit or 0.5 credit if Biology 61.102 is taken in lieu of the OAC in Biology.

Notes on Programs

1. In the Biology/Biotechnology program, "Honours Subjects" used for calculation of Honours GPAs include all courses taken in Biology and Biochemistry.

2. In the Biochemistry/Biotechnology program, "Honours Subjects" used for calculation of Honours GPAs include all courses taken in Biochemistry, plus the Biology and Chemistry courses fulfilling requirements 1, 3 and 6 above.

3. In choosing a program, students should consider the prerequisites for any courses that they may wish to take in later years; in particular some options listed in requirements 1 and 6, above, may be offered only in alternate years and may require as prerequisites for one or other of Biology 61.325 ★ and 61.335 ★. Because of timetable constraints students may have to take Chemistry 65.211 ★ and Biology 61.201 ★ or 61.202 ★ in different years.

4. Credit will not be given for Biology 61.220 ★ or Biochemistry 63.220 ★ taken after Biochemistry 63.310 or equivalent.

5. A completed credit for Biology 61.100, 61.102 or 61.209 ★ and 61.230 ★ may replace the requirement for Biology 61.103 ★ and 61.104 ★. Students who have completed only Biology 61.230 ★ may replace 61.103 ★ with 61.230 ★. Students who have completed only 61.209 ★ must pass 61.103 ★ and 61.104 ★; Biology 61.209 ★ may then be credited as a Biology elective.

6. Students who wish to take 61.214 ★ in the Winter term of their first year must obtain a grade of C- or better in 61.103 ★.

Typical Course Patterns

Biology and Biotechnology

First Year

Biology 61.103 ★ and 61.104 ★;

Chemistry 65.100;

Physics 75.101 ★, and 75.102 ★ or 75.107 ★ and 75.108 ★;

Mathematics 69.107 ★, 69.117 ★;

1.0 credit, arts or social science option.

Second Year

Biology 61.201 ★, 61.202 ★, 61.214 ★, 61.220 ★, 61.233 ★; 0.5 credit Biology option;

Chemistry 65.223 ★ and 65.224 ★;

1.0 credit, arts or social science option.

Third Year

Biology 61.314 ★, 61.321 ★, 61.325 ★, 61.335 ★, 0.5 credit Biology option;

Biochemistry 63.310 and 63.305 ★;

Mathematics 69.257 ★;

0.5 credit, free option.

Fourth Year

1.0 credit from Biology 61.416 ★, 61.419 ★, 61.421 ★, 61.432 ★;

1.0 advanced option credit (see 6 above);

Biochemistry 63.404 ★;

Biology 61.430 ★ or 61.431 ★;

Biology 61.491 ★ and 61.498;

0.5 credit, free option.

Biochemistry and Biotechnology

First Year

Biology 61.103 ★ and 61.104 ★;

Chemistry 65.100;

Physics 75.101 ★ and 75.102 ★, or 75.107 ★ and 75.108 ★;

Mathematics 69.107 ★, 69.117 ★;

1.0 credit, arts or social science option.

Second and subsequent years

Students are advised to plan their programs for a least second and third year simultaneously. Thus a choice between 61.201 ★ and 61.202 ★ in second year determines whether 61.325 ★ or 61.335 ★ can be taken in third year. Students should also note that 65.223 ★ and 65.224 ★ are prerequisites for mandatory courses while 65.211 ★ is not.

Business

(Public Affairs and Management)

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Supervisor, Professional Development, W. Lawson

Teaching Staff

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Associate Professors

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Assistant Professors

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Instructors

Ann Clarke-Okah, B.A. (Simon Fraser), Cert. Admin. (Brock), C.A. • **Anna L. Gibbons**, B.A., B.Ed., M.B.A. (Ottawa) • **J.D. Herauf**, B.Com. (Saskatchewan), C.A., C.G.A. • **Jacques Maurice**, B.Adm. (Ottawa), C.A., C.M.A. • **Lorna Unger**, B.A. (Manitoba), M.A. (Carleton)

Adjunct Professors

C. Hobbs, Carleton University • **W. L. Weber**, Carleton University

Adjunct Research Professors

C. Higgins, University of Western Ontario • **I. Kaliszewski**, Systems Research Institute • **G. R. Mallory**, Open University • **S. Maguire**, Carleton University • **Darren B. Meister**, Queen's University • **Z. Mikolajuk**, IDRC • **L. Moffat**, Carleton University • **Sunil Noronha**, IBM Thomas J. Watson Research Centre • **S. Szpakowicz**, University of Ottawa

Programs of Study

The School of Business offers two undergraduate degree programs: Bachelor of Commerce with Honours (with or without a Concentration, and with or without Co-op Option) and Bachelor of International Business with Honours; two graduate degree programs: Master of Management Studies (Thesis and Project Options) and Doctor of Philosophy in Management; and one Minor in Business for non-business students.

Bachelor of Commerce with Honours

The Commerce program offers students a variety of ways of tailoring their educational experience and studies to their career objectives. The options are: a general Honours Commerce degree; an Honours Commerce degree with one Concentration; an Honours Commerce degree with two Concentrations. All three options may be done with or without a Co-op Option. The area(s) of Concentration as well as the Co-op Option would appear on the diploma.

Graduation Requirements

In order to graduate, students must fulfill all University graduation regulations (see p. 48) and all Faculty regulations (see p. 74), in addition to all School regulations and requirements as set out below.

Admission Requirements

First Year

Students may gain admission to the B.Com. program through one of two ways.

High School applicants must normally have the OSSD, or equivalent, including at least six OACs, with an overall average of 70 percent or better. Of the six OACs, one must be Calculus (with a grade of 60 percent or better), one must be either Algebra/Geometry or Finite Mathematics, and one must be English. For applicants whose first language is not English, the requirement of OAC

English can also be met under the conditions outlined in the section "English Language Requirements" on p. 31 of this calendar.

Applicants, who have successfully completed Qualifying-University Year with a GPA of 6.5 or better and a CI of 6.0 or better, who have completed Mathematics 69.007★ and/or 69.017★ (if the corresponding Mathematics OACs or equivalents were not taken), and who offer an OAC English credit or equivalent, may also be admitted to First Year.

Note: Algebra/Geometry is the preferred OAC Mathematics course, and students who do not present this OAC will be required to take the equivalent course from the School of Mathematics and Statistics during their first year.

Students who do not meet the standards required for entry to the B. Com. program may elect to take their First year in the B. A. program. The First year program should include Business 42.101★, and 42.102★, Economics 43.100 and Mathematics 69.109★ and 69.119★. Application may then be made for admission to the Second year of the B.Com. Program.

Second and Subsequent Years

Applications for admission to the Second or subsequent years will be assessed on their merits. Advanced standing will be granted only for those courses that are determined to be appropriate for the Commerce program. Students must present an Honours Commerce GPA of 6.5 or better, and a CI of 6.00 or better. On admission to the Commerce program, students will not receive credit for courses graded below C-.

Entry with Co-op Option

Admission into the Co-op Option can occur:

1. directly upon being accepted to the First year of the B.Com. program, for a student meeting requirements for the "Entry with Co-op Option" given on page 42.
2. from within the B.Com. program for a student who
 - has a cumulative GPA of 8.0 or better in Commerce and a C.I. of 6.5 or better overall;
 - has successfully completed 4.0 core credits in Commerce;
 - is registered as a full-time student.

Note that meeting the above requirements only establishes eligibility for admission to the program.

Eligibility for Placement in the First Work Term of the Co-op Option

To be eligible for placement in the first work term of the Co-op Option a student must meet the following requirements by the end of the term preceding the first job placement process:

- successful completion of 6.0 core credits in Commerce;
- a cumulative GPA of 8.0 or better in Commerce and a C.I. of 6.5 or better overall;
- registration as a full-time student; and
- eligibility to work in Canada.

Academic Standing

Academic Standing will be assessed according to the standards and criteria on p. 71 (5.2) of this Calendar with the following exception:

Probation (as defined in 5.8 of the regulations on p. 72) is not available to students in the Bachelor of Commerce program.

Concentration GPA

Students registered in Concentrations are reminded (see 7.5 p. 75) that Concentration GPA establishes eligibility for the Concentration notation on the diploma at the time of graduation. The GPA in a concentration must be 6.5 or better. This GPA shall be calculated over all successfully completed courses (core and optional) that are to meet the requirements specified for the chosen Concentration.

Additional Requirements for Continuation in the Co-op Option Program Beyond the First Work Term

Students must:

- a) meet the academic standards required to continue in the B.Com. program;
- b) maintain full-time status in each study term from the point of entry into the option through to the final academic term (An exception to this is granted if a student has sufficient credits to be able to register as a part-time student in the final term.);
- c) obtain a *Sat* grade in all Work-term Report courses;
- d) accept positions which they have been awarded;
- e) attend all pre-arranged interviews with employers;
- f) maintain legal eligibility to work in Canada.

Students who are required to withdraw from the Co-op Option due to failure to meet any of the conditions listed above except the first one, will be eligible to continue in their B.Com. program.

Credits Earned by Exchange Agreements

Bachelor of Commerce students in good standing may be eligible to study elsewhere on one or more of the many exchange agreements available to undergraduate students. Students who wish to study overseas should contact the Exchange Coordinator at the School of Business for information. Registration for business courses in the Faculty of Administration at the University of Ottawa requires approval of the School of Business and of the appropriate department at the University of Ottawa.

Credit Requirements

Candidates for the B.Com. degree must take a minimum of 20.0 credits.

Completion of Work term courses does not earn credits toward the B.Com. degree with or without Co-op Option. Completion of any of the Work term courses will not be counted as an "Attempt" as defined in Section 5.4 of the Academic Regulations (see p.71)

Students with a prior university degree will receive advanced standing where appropriate. Acceptance in the program will be governed by the standards required for entry to the Honours program; however, a minimum of 7.0 additional credits will be required, following admission to the program, for the Bachelor of Commerce degree.

Students who propose to include language courses in their program must obtain prior approval from the School.

Required (Core) Courses

The following is a list of courses that all students in the B.Com. program must take. Individual students may wish to adapt the timing of the courses to meet their own particular needs.

First Year Courses

Business 42.104★, 42.105★, 42.142★
Economics 43.100

Mathematics 69.109 ★ or 69.107 ★
 Mathematics 69.119 ★ or 69.117 ★
 Psychology 49.101 ★ and 49.102 ★ or Sociology 53.100

Second Year Courses

Business 42.211 ★, 42.228 ★, 42.230 ★, 42.240 ★, 42.254 ★, 42.261 ★
 Economics 43.202 ★, 43.212 ★
 Economics 43.220 or Mathematics 69.266 ★ and 69.267 ★

Third Year Courses

Business 42.313 ★, 42.317 ★, 42.330 ★

Fourth Year Courses

Business 42.461 ★;
 Business 42.469 ★ (except students with International Business Concentration option who must take Business 42.479 ★);
 2.0 additional 400-level credits of which at least 1.0 credit must be selected from courses offered by the School of Business (400-level credits earned as Concentration requirements can be applied towards this requirement as well).

Required Courses in the Co-op Option

During a work term, Co-op students must be registered in one of four Co-op work term report courses: Commerce 42.391 ★, 42.392 ★, 42.393 ★, 42.394 ★. While on a work term, students may register in an additional 0.5 credit course, unless they have written support from their employers to take 1.0 credit. Under no condition may they register for more than 1.0 additional credit.

Co-operative Option in Bachelor of Commerce

General information on Co-op programs can be found on p. 39.

Students in the Co-op option must satisfy the normal requirements for their degree programs as well as the graduation requirements specific to the Co-op Option in order to graduate with a "Co-operative Option" notation.

Co-op Regulations

The B.Com. Co-op Option Program is governed by regulations set out in this calendar. Important information and guidelines are detailed also in the B.Com. Co-op Handbook. Students are responsible for complying with these regulations and guidelines.

The Work Term/Study Term Sequence

Students admitted to the Co-op Option normally enter the workplace for their first work term on completion of year two in the Bachelor of Commerce program. The normal requirement for Co-op notation is satisfactory completion of four work terms.

The following patterns of Work Term/Study Term sequence are currently available:

General Model*

Calendar Year	Fall	Winter	Summer
1	Study Term	Study Term	
2	Study Term	Study Term	Work Term
3	Work Term	Work Term	Work Term
4	Study Term	Study Term	
5	Study Term	Study Term	

Accounting Model*

Calendar Year	Fall	Winter	Summer
1	Study Term	Study Term	
2	Study Term	Study Term	Work Term
3	Study Term	Work Term	Study Term
4	Study Term	Work Term	Work Term
5	Study Term		

* Variations may become available as needs arise.

Variations in the work term/study term sequence may be requested due to academic or work situations in upper years. Precise start and finish dates for work terms are established in consultation with Co-op employers. All work terms must be completed before the final study term.

Change of Work Term - Academic Study Sequence

Upon entry into the Co-op option, a student is expected to follow a prescribed work term/study term sequence. However, applications to change the sequence will be considered by the School.

Co-op Placement Fees

A placement fee will be charged for each Co-op work term. The fee will be due in accordance to regulations governing university's tuition fees.

Work Term Assessment

Successful completion of a work term is achieved by receiving a "satisfactory" grade. This grade will be based both on the quality of the mandatory Work Term report and a satisfactory evaluation from the employer (see below). Students are required to register in the corresponding Work Term Report course and to submit a written work term report at the end of each work term. For a two-term work period, two work term reports - one at the end of each term - will be due. Employers may require additional reports from students as part of the job. Normally, for a report to be considered, it must have been written during the work term and be related to or evoked by the work term activity. In addition, Co-op students will be assessed on their work performance by their work place supervisor, the assessment being reported to the Co-op Office.

The Co-op Office provides a set of written guidelines for work term reports. Work term reports are evaluated and graded *Sat* or *Uns* by a designated faculty member.

An *Uns* grade in a Work Term Report course will not affect a student's academic progress in the B.Com. degree program, but will result in a loss of eligibility to continue in the Co-op Option. In such events, student's diploma, B.Com.(Honours), will not have the additional notation of "Co-operative Option".

Voluntary Withdrawal from the Co-op Option

Students may withdraw from the Co-op Option without penalty and without reimbursement of the Co-op fees paid. Such students are eligible to continue in their regular program provided they meet the academic standards required for continuation in that program.

Required Withdrawal from the Co-op Option

Students may be required to withdraw from the Co-op Option, and without reimbursement of the Co-op fees paid, for one of more of the following reasons:

- Failure to meet the academic standards required for continuation in the Co-op Option (see other parts of this calendar for details);
- Failure to submit a work term report;
- Obtaining an *Uns* grade in a Work Term Report course;
- Dismissal with cause by an employer;
- Refusal to accept a position which the student has ranked;
- Failure to report to an employer or leaving an employer without prior approval;
- Independent search, without prior permission, for a work placement by a student who has previously elected to take part in the normal application and interview process arranged by the Co-op Office;
- Missing a pre-arranged interview with an employer.

Concentrations

In the Bachelor of Commerce program, a Concentration is a structured set of courses, which complements and accents a core business education. Successful completion of a prescribed set of courses, along with fulfillment of other requirements of the degree, leads to an *official notation of a Concentration on the diploma and the transcript*. The Concentrations are designed to meet both the job market and student needs and are open only to students registered in the Bachelor of Commerce program. The requirements for the Concentrations vary.

For a Bachelor of Commerce degree with a Concentration, one must successfully complete the set of B.Com. Core Credits, a set of Concentration Core Credits, and Concentration Options (a specified number of courses from a list specifically designed to augment the core courses in a chosen Concentration). The Concentration Core Credits and the Concentration Options will be applied toward the Options requirements for the B.Com. (Honours) degree.

Students are not permitted to register in or graduate with more than two Concentrations. No more than 2.0 *Concentration credits* may be applied towards requirements of both the selected Concentrations.

The order in which the courses listed for the Concentrations are taken should be planned in advance. Students are therefore strongly advised to consider their concentration choices by the end of their first year.

• Accounting

The Concentration in Accounting is designed to provide a foundation for careers in financial accounting, management accounting and/or auditing. It provides a base for individuals wishing to pursue a professional designation in accounting, including the C.A. (Chartered Accountant), C.M.A. (Certified Management Accountant), and/or C.G.A. (Certified General Accountant) designations. Students interested in these designations should consult with one of the faculty members in accounting.

The Concentration in Accounting requires: 2.0 Concentration Core Credits: 42.201 ★, 42.202 ★, 42.301 ★ and 42.308 ★. Concentration Options comprise 2.0 credits to be chosen from: 42.255 ★, 42.305 ★, 42.400 ★, 42.401 ★, 42.402 ★, 42.407 ★, 42.408 ★, 42.440 ★.

• Business Operations Analysis

The Concentration in *Business Operations Analysis* is designed to provide a foundation for students interested in career opportunities in decision support functions, group decision making, and support of business negotiations. Successful completion of the Concentration in *Business Operations Analysis* would satisfy the requirements for the diploma of the Canadian Operational Research Society (CORS), a professional designation. Students interested in

pursuing this professional designation should consult with one of the faculty members in this area. The *Concentration in Business Operations Analysis* requires 2.0 Concentration Core Credits: 42.435 ★, 42.436 ★, 42.338 ★, and 42.446 ★. Concentration Options comprise 2.0 credits to be chosen from: 42.242 ★, 42.327 ★, 42.340 ★, 42.437 ★, 42.447 ★, 69.353 ★, 69.354 ★, 69.357 ★, 70.460 ★.

• Finance

The Concentration in Finance is designed to prepare students to pursue careers in corporate financial management, financial analysis, corporate planning, investment banking, financial services, portfolio management, and financial consulting. The Finance Concentration also provides students with the necessary foundation to pursue a professional designation in Finance such as the C.F.A. (Chartered Financial Analyst).

Students registered in the B.Com. program may earn the Bachelor of Commerce with a Concentration in Finance designation by completing 4.0 credits in addition to the B.Com. core. Of these 4.0 credits, 2.0 credits must comprise 42.255 ★, 42.350 ★, 42.352 ★, and 42.354 ★. In addition, those students who wish to focus on *corporate finance* may complete the concentration requirements by taking 42.450 ★ and 1.5 credits of options from among: 42.201 ★, 42.202 ★, 42.242 ★, 42.301 ★, 42.340 ★, 42.343 ★, 42.416 ★, and 42.452 ★. Those students who wish to focus on *financial services* may complete the concentration requirements by taking 42.452 ★ and 1.5 credits of options from among: 42.201 ★, 42.202 ★, 42.242 ★, 42.301 ★, 42.340 ★, 42.343 ★, 42.416 ★, and 42.450 ★. Students with either focus may also take 42.550 with permission from the School.

• Information Systems

The Concentration in Information Systems is designed to provide a strong managerial and technical foundation for individuals wishing to pursue careers analyzing, designing, implementing and maintaining information systems.

The Concentration in Information Systems requires: 2.5 Concentration Core Credits: 42.242 ★, 42.340 ★, 42.343 ★, 42.344 ★, 42.440 ★. Concentration Options comprise 2.0 credits to be chosen from: 42.338 ★, 42.416 ★, 42.442 ★, 42.444 ★, 42.446 ★, 42.447 ★, 42.467 ★, 59.405 ★.

• International Business

The Concentration in International Business is designed to combine the core strength of the B. Com. program with a solid understanding of international business and management. It requires 2.5 Concentration Core Credits: 42.373 ★, 42.374 ★, 42.417 ★, 42.425 ★, 42.474 ★. Concentration Options comprise 2.0 credits: 1.0 Option credit is to be chosen from: Business: 42.352 ★, 42.354 ★, 42.361 ★, 42.416 ★, 42.464 ★, 42.530 and 42.531; and, 1.0 credit must be chosen from: European and Russian Studies 55.405 ★; Economics 43.361 ★, 43.362 ★, 43.370 ★; Geography 45.220 ★, 45.329 ★, 45.344 ★; Law 51.327 ★, 51.420 ★; Political Science 47.260, 47.360 ★ or other courses with permission of the School.

• Marketing

The Concentration in Marketing is designed for students interested in a managerial, behavioural, international, or research approach to marketing. The *Concentration in Marketing* requires 2.0 Concentration Core Credits: 42.327 ★, 42.426, 42.428 ★. Concentration Options comprise 2.0 credits to be chosen from: Business 42.324 ★, 42.325 ★, 42.328 ★, 42.423 ★, 42.425 ★. Other courses, complementary to the Concentration, may be counted as options by prior permission of the School.

• Strategic Human Resources Management

The Concentration in Strategic Human Resources Management is designed to provide a conceptual foundation for students interested in career opportunities in personnel/human resource management, management consulting, and labour/industrial relations. Those interested in professional designations such as the Certified Human Resources Professional (CHRP) and the Comprehensive Provincial Examination (CPE), both offered by the Human Resources Professionals Association of Ontario (HRPAO), should consult one of the faculty members in the area. The Concentration in Strategic Human Resources Management requires: 2.5 Concentration Core Credits: Business 42.312★, 42.413★, 42.414★, 42.415★, 42.416★. Concentration Options comprise 2.0 credits to be chosen from: Business 42.373★, 42.417★, 42.418★, 42.462★, Economics 43.356★, Psychology 49.313★, Law 51.306★, 51.341★, 51.442★ and Sociology-Anthropology 56.358★. Students may also take one of 42.510 or 42.511 with permission from the School.

• Technology and Operations Management

The Concentration in Technology and Operations Management focuses on managing operations in a global economy. It is designed to lay the foundation for careers in hi-tech manufacturing including managing the transfer of new products into manufacturing, full-scale production, and supply and distribution as well as in operations in other manufacturing or in service industries. The Concentration will have an applied focus to provide students with as much practical experience as possible.

Students may earn a Concentration in Technology and Operations Management by completing 4.0 credits in addition to the B.Com. core. Of these, 2.0 credits must be: Business 42.332★, 42.333★, 42.447★, and 42.467★. The other 2.0 credits for Concentration Options are to be chosen from: Business 42.308★, 42.334★, 42.338★, 42.416★, 42.444★, 42.435★, 42.561★, 42.571★.

Bachelor of International Business with Honours

The Bachelor of International Business with Honours is a limited-enrolment program designed to provide depth in both international business studies and in a major language used in international business. In addition, courses give an exposure to social sciences which are related to international business, and a year at a foreign university develops in students an experience-based international and intercultural point of view.

Course Requirements

The Bachelor of International Business program consists of the following 20.0 credits:

- 10.5 credits of non-language core courses;
- 4.0 credits of core language courses (in one language);
- 5.5 credits of electives.

The language to be studied must be selected in consultation with the School of Business Supervisor of Undergraduate Programs.

Graduation Requirements

In order to graduate, students must fulfill all University graduation requirements (see p. 48) and all Faculty regulations (see p. 74), in addition to all School regulations and requirements as set out below.

Admission Requirements

The OSSD or the equivalent with an average of 75 percent or better, including at least six OACs. Of the six OAC's, one must be English and another must be Calculus, or Algebra/Geometry, or Finite Mathematics. A grade of 60 percent or better is required in the mathematics course offered. If Finite Mathematics is offered, the

student must also have successfully completed Grade 12 Advanced Mathematics.

For applicants whose first language is not English, the requirement of OAC English can also be met under the conditions outlined in the section "English Language Requirements". (see p. 31).

Some knowledge of another language will be beneficial.

• Second or Subsequent Years

Applications for admission to Second or subsequent years will be assessed on their merits, subject to available spaces. Advanced standing will be granted only for those courses that are determined to be appropriate for the International Business program. Students who are admitted with advanced standing may have to delay the Third Year Abroad requirement until the First- and Second-year curricula are completed. Students must present an Honours International Business GPA of 6.5 or better, and a CI of 6.00 or better. On admission to the Bachelor of International Business program, students will not receive credit for courses with grades below C-.

Academic Standing

To continue in the B.I.B. program, students proceeding into Second year must have and maintain a GPA of 6.0 or better in Business and Economics Core Courses of the program and a GPA of 6.0 or better in Language Core Courses.

To proceed into and continue in Third or Fourth year of the Bachelor of International Business program, students must have and maintain a GPA of 6.5 or better in Business and Economics Core Courses and a GPA of 6.5 or better in Language Core Courses.

In all years, students must also maintain a CI of 6.00 or better.

Credits in all Required (Core) Courses are used for GPA calculation except any taken abroad.

Language Training Component

Students may select French, German, Japanese, or Spanish as their desired language for study. Students should give both a first and second choice as their first choice may be oversubscribed. Students are strongly advised to continue their study and use of their selected language on their own in the summers between academic years. Failure to do so may seriously undermine their efforts during the year of study abroad.

Students interested in languages other than those listed above should contact the School of Business Supervisor of Undergraduate Programs to verify if the preferred language option may have become available after the publication of this calendar.

All First year Bachelor of International Business students will be assessed for their ability in their selected language by the relevant language unit and placed in the appropriate courses as authorized by the language unit.

Students with some ability in their selected language may be allowed to pursue studies in that language on the understanding that they will effect a significant improvement in their ability.

Required (Core) Courses

First Year

2.0 credits of French, German, Japanese, or Spanish
Business 42.171★, 42.173, 42.270★
Economics 43.100

Second Year

2.0 credits of French, German, or Spanish
Business 42.211★, 42.224★, 42.240★, 42.254★

Economics 43.220 or Mathematics 69.266 ★ and 69.267 ★
Or

1.0 credit of Japanese

Business 42.211 ★, 42.224 ★, 42.240 ★, 42.254 ★

1.0 credit from Business 42.255 ★, 42.261 ★, 42.313 ★, 42.325 ★

Economics 43.220 or Mathematics 69.266 ★ and 69.267 ★

Notes:

The language credits must be pre-specified by course numbers by the selected Language units. Students are advised not to register in courses before they are specified.

Third Year (Abroad)

The Third year will be spent taking a set of courses at a foreign institution approved by the Carleton University School of Business. The number of courses available in English in foreign schools may vary. Students will take up to 5.0 credits as outlined below. Carleton credits commensurate to courses taken abroad will be determined by the School and awarded towards the student's degree.

In order to be eligible to study abroad in Third year, students are required to have successfully completed a minimum of 4.0 specified Language Core Credits (except in the case of Japanese; see details) and 5.0 Business and Economics Core Credits from First and Second year and be in Good Standing.

(Students taking Japanese: see the modification in the overview above.)

3.0 credits in Business or Economics at the 200-level or higher

1.0 credit of any subject

1.0 credit in Political Science, History, Geography, Law, Sociology, Anthropology, or Women's Studies.

Note: At least 1.0 credit of the above must be delivered in the student's selected language.

Students are responsible for all traveling, living and incidental costs for fulfilling Third-year requirements abroad. Tuition fees and compulsory miscellaneous fees will be paid to Carleton University according to Carleton University's fee structure. The student may be liable for compulsory miscellaneous fees assessed by the foreign institution.

A limited number of bursaries which may offset the cost somewhat are usually available for which a student can apply. The details of these bursaries can be obtained from the Awards Office.

Fourth Year

Business 42.373 ★, 42.461 ★, 42.471 ★, 42.479 ★

1.5 credits from: Business 42.330 ★, 42.354 ★, 42.374 ★, 42.417 ★, 42.425 ★,

42.474 ★, 42.530, 42.531

1.0 credit of Business courses 200-level or above

0.5 credit of non-specified elective.

Minor in Business

Students registered in degree programs other than the Bachelor of Commerce or Bachelor of International Business, and who are in Good Standing in their programs of study, may register for the Minor in Business through the office of the Undergraduate Program Adviser in the School of Business. The Minor will be earned through successful completion of the 5.0 credits specified below, with a GPA of 6.0 or better. On successful completion of all requirements, the designation "Minor in Business" will be added to the student's transcript and diploma.

Students wishing to pursue this option are urged to register in the Minor in Business Program at the School of Business office. Registration will enable the School to plan the services required and to provide students with proper guidance and counseling. To remain in the Minor program, students must maintain a GPA of 6.0 in

the Minor courses. Standing will be annually audited once a registered student has completed 2.0 credits in the Minor courses, and students who fail to maintain the required GPA will be deregistered from the Minor.

Students in some degree programs may not have sufficient "free" electives to complete the requirements for the Minor in Business within the normal number of courses designated for their degree. In such cases, students choosing to pursue the Minor option, with its additional certification, will have to fulfill the requirements of the Minor over and above the requirements of their primary degree program.

Required Courses (3.0 credits)

42.101 ★ Principles of Financial Accounting

42.102 ★ Management Accounting

42.211 ★ Introduction to Organizational Behaviour

42.224 ★ Basic Marketing

42.240 ★ Introduction to Information Systems

42.254 ★ Essentials of Finance

Elective Courses

2.0 credits must be completed from among any other Business courses. Of these 2.0 credits, at least 1.0 credit must be at or above 300-level. A list of optional courses deemed suitable for the program, and regulations governing their admissibility for credit, can be picked up from the School's Undergraduate Program Adviser's office.

Master of Management Studies

The School of Business offers a graduate program in the field of management leading to the Master of Management Studies (M.M.S.).

The focus of the program is applied research directed toward developing productivity and innovation in Canadian business. The skills developed in the program are deemed to be essential if Canadian businesses are to be more productive and innovative in the increasingly competitive and complex world economy. The M.M.S. program requires successful completion of the equivalent of 5.0 credits through either a thesis or a research project option.

The areas of specialization within the M.M.S. program are:

Business Information Systems, Finance, International Business, Management, Marketing, Production and Operations, Research and Development Administration

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

B.Com. and B.I.B. students should use Business (42) prefix for registering in courses that are cross-listed with other Carleton units.

In addition to the following list of courses, students may wish to consider graduate (500-level) courses. Their descriptions can be found in the *Graduate Calendar*. Registration in them requires Fourth-Year Standing, an overall GPA of 9.0 at the time of registration, and permission of the School of Business.

Business 42.101 ★

Principles of Financial Accounting

Discussion of the concepts of asset valuation and income measurement underlying the preparations and interpretation of financial statements.

Precludes additional credit for Business 42.100, 42.104 ★ and 42.270 ★.

Lectures three hours and tutorials one hour a week.

Business 42.102 ★

Management Accounting

An introduction to the problems of the use of accounting data for the purposes of planning and control of operations.

Precludes additional credit for Business 42.100, 42.105 ★ and 42.270 ★.

Prerequisite: Business 42.101 ★.

Lectures three hours and tutorials one hour a week.

Business 42.104 ★

Integrated Accounting I

An integrated approach to the basic concepts of both financial and managerial accounting. The users and uses of accounting information. Accounting issues involving income and cash-flows.

Precludes additional credit for Business 42.100, 42.101 ★ and 42.270 ★.

Prerequisite: Restricted to students registered in the B.Com. program.

Lectures three hours and tutorials one hour a week.

Business 42.105 ★

Integrated Accounting II

Accounting issues related to the management and use of economic resources and capital. Additional financial and managerial accounting topics are introduced along with related concepts in auditing, taxation and information technology.

Precludes additional credit for Business 42.100, 42.102 ★ and 42.270 ★.

Prerequisite: Business 42.104 ★ (with a grade of C- or better). Restricted to students registered in the B.Com. program.

Lectures three hours and tutorials one hour a week.

Business 42.142 ★

Programming for Business Students I

Basic control structures of sequence, selection, and iteration. Focus on problem solving in the context of programming for Business. Structured and visual languages may be taught.

Lectures three hours a week.

Business 42.171 ★

Introduction to International Business

An introduction to the principles and practices of international business. Topics include political and cultural differences, trade theory, global marketing, global human resource management and global strategy.

Precludes additional credit for Business 42.210 ★.

Prerequisite: Enrolment in the B.I.B. program.

Lectures three hours a week.

Business 42.173

Quantitative Methods in Business

Quantitative tools employed in business and economics. Aspects of differential and integral calculus, finite series, linear algebra, and matrix theory.

Precludes additional credit for Mathematics 69.007 ★.

Prerequisite: Enrolment is restricted to students in the B.I.B. program.

Lectures three hours and tutorials one hour a week.

Business 42.201 ★

Intermediate Accounting I

An examination of accounting and reporting issues related primarily to asset valuation and revenue recognition.

Precludes additional credit for Business 42.200.

Prerequisites: Business 42.101 ★ and 42.102 ★; or 42.104 ★ and 42.105 ★ (with a grade of C- or better in each).

Lectures three hours and tutorials one hour a week.

Business 42.202 ★

Intermediate Accounting II

An examination of accounting and reporting issues related primarily to liabilities and equities.

Precludes additional credit for Business 42.200.

Prerequisite: Business 42.201 ★ (with a grade of C- or better).

Lectures three hours and tutorials one hour a week.

Business 42.211 ★

Introduction to Organizational Behaviour

Models of individual and small group behaviour in organizations. Topics include motivation, communication, job design, leadership and group dynamics to provide systematic explanations of employee and managerial behaviour in organizations.

Precludes additional credit for Business 42.311 ★.

Lectures three hours a week.

Business 42.224 ★

Basic Marketing

Basic problems and practices in marketing, for students without a background in accounting and business. Marketing strategy, planning, packaging, branding and promotion at the level of the individual firm.

Precludes additional credit for Business 42.228 ★.

Prerequisite: Registration in B.I.D., B.I.B., Minor in Business or the Management Concentration in Engineering.

Lectures three hours a week.

Business 42.228 ★

Introduction to Marketing

Overview of the marketing function within the firm. Promotion, product design, pricing and distribution channels are examined. Consumer buyer behaviour, trends in retailing, wholesaling, sales force management and marketing research are also reviewed. Case studies are used.

Precludes additional credit for Business 42.224 ★.

Prerequisites: Business 42.101 ★ and 42.102 ★, or 42.104 ★ and 42.105 ★, Economics 43.100 and one of Psychology 49.101 ★ and 49.102 ★, or Sociology 53.100 (with a grade of C- or better in each).

Lectures three hours a week.

Business 42.230 ★

Introduction to Management Science

Introduction to management science techniques that are routinely used as decision aids in government and industry. The course examines linear programming techniques, decision analysis and simulation. Students are introduced to quantitative models for decision making.

Precludes additional credit for Economics 43.404 ★ and Engineering 94.320 ★.

Prerequisites: Business 42.142 ★; Mathematics 69.109 ★ and 69.119 ★.

Lectures three hours a week.

Business 42.240 ★

Introduction to Information Systems

Management issues associated with information systems in organizations. Definition, description, fundamental technologies impacts and development of information systems, and associated ethical issues.

Prerequisite: Second-year standing

Lectures three hours a week.

Business 42.242 ★

Programming for Business Students II

Structured programming in procedural languages. Advanced concepts of iteration, sequence and selection. Algorithms for searching, sorting, string processing and numerical analysis.

Precludes additional credit for Computer Science 95.102 ★ and 95.108 ★.

Prerequisite: Business 42.142 ★ (with a grade of C- or better).

Lectures three hours a week.

Business 42.254 ★

Essentials of Business Finance

Business firms' financing, capital investment, and dividend policy

decisions, cost of capital and short-term asset management problems (Also listed as Economics 43.254 ★.)

Precludes additional credit for Business 42.250 ★.

Prerequisites: Business 42.105 ★ or 42.102 ★ or 42.270 ★ (with a grade of C- or better).

Business 42.255 ★

Business Finance

Capital investment and financing decisions in the context of risk and return tradeoffs. Primary and derivative securities, and their role in risk management. Mergers, corporate restructuring, the theory of principal-agent relationships, and financial planning, forecasting, and control. (Also listed as Economics 43.255 ★.)

Precludes additional credit for Business 42.250 ★.

Prerequisites: Business 42.254 ★, Economics 43.100, or Engineering 91.380 ★, Business 42.173 or Mathematics 69.109 ★ and 69.119 ★.

Lectures three hours a week.

Business 42.261 ★

Business Law I

The legal system and legal ordering as they affect those engaged in business and economic activities. Particular emphasis on the law of tort and the law of contract.

Precludes additional credit for Law 51.231 ★.

Prerequisite: For students registered in the B.Com., B.I.B. or Minor in Business only.

Note: Students in Law programs cannot include Business 42.261 ★ towards the fulfillment of their degree requirements, even as an option, nor can they claim credit for it toward their Minor in Business certification.

Lectures three hours a week.

Business 42.262 ★

Business Law II

Legal topics of importance to those involved in business relationships. These topics include forms of business organization, property law and specialized contractual relationships such as sale of goods, negotiable instruments, personal property security, insurance, bailment and agency.

Precludes additional credit for Law 51.232 ★.

Prerequisite: Business 42.261 ★ or Law 51.231 ★ (with a grade of C- or better).

Note: Students in Law programs cannot include Business 42.262 ★ towards the fulfillment of their degree requirements, even as an option, neither can they claim credit for it toward their Minor in Business certification.

Lectures three hours a week.

Business 42.270 ★

Accounting Fundamentals

Financial and managerial accounting from the perspective of a user of accounting data. Tools necessary to understand and perform analysis of financial statements. Both North American and international accounting principles and practices. Product costing and the use of accounting data for management decision making and control.

Precludes additional credit for Business 42.101 ★, 42.102 ★, 42.104 ★ and 42.105 ★.

Prerequisite: Enrolment in the B.I.B. or in the Management Concentration in Engineering program.

Lectures three hours a week.

Business 42.301 ★

Accounting for Business Combinations

Consideration of accounting problems associated with business combinations. Particular attention is given to the preparation of consolidated financial statements. Discussion may also extend to financial reporting and diversified companies, reorganizations, etc. Selection of some topics may vary from year to year.

Prerequisite: Business 42.202 ★ (with a grade of C- or better). Lectures three hours and tutorials one hour a week.

Business 42.305 ★

Taxation 1: Introduction to Federal Income Tax

An examination of federal income tax laws and regulations and their impact on an individual's financial and business decisions. Problems, issues and planning associated with the Income Tax Act and concerned with the computation of taxable income and taxes payable by an individual are discussed.

Prerequisite: Business 42.202 ★ (with a grade of C- or better).

Lectures three hours and tutorials one hour a week.

Business 42.308 ★

Cost Accounting

The use of accounting information for purposes of cost control and performance evaluation. Emphasis is on cost accumulation systems, performance evaluation, control models and analytical tools.

Prerequisites: One of Business 42.102 ★ or 42.105 ★ and Economics 43.220 or Mathematics 69.267 ★ (with a grade of C- or better in each).

Lectures three hours and tutorials one hour a week.

Business 42.312 ★

Introduction to Human Resources Management

Human Resource Management function in large formal organizations. Topics include human resources planning, recruitment, selection, performance evaluation, career development and training, compensation and benefits and the role of the professional personnel manager.

Prerequisite: Business 42.211 ★ or 42.311 ★ (with a grade of C- or better).

Lectures three hours a week.

Business 42.313 ★

Introduction to Organization Theory

Macro-organization theory. Structuring of organizations in a complex global economy. The effects of the external environment, technology, culture and organizational goals on the structure, processes and effectiveness of the organization are examined.

Precludes additional credit for Business 42.210 ★.

Prerequisites: Third-year standing and Business 42.211 ★ (with a grade of C- or better).

Lectures three hours a week.

Business 42.317 ★

Introduction to Industrial Relations

Industrial relations covering such topics as industrial relations systems, the functioning of trade unions, collective bargaining in Canada and Canadian public policy in industrial relations. (Also listed as Economics 43.357 ★.)

Prerequisites: Business 42.211 ★ and Economics 43.100.

Lectures three hours a week.

Business 42.324 ★

Marketing: New Tools and Approaches

Introduction and assessment of key new marketing tools and approaches, e.g., marketing on the Internet, relationship marketing, direct marketing. Effective adoption and implementation of these tools and approaches across a variety of industries and organizations will be considered.

Prerequisite: Third-year Standing and Business 42.224 ★ or 42.228 ★ (with a grade of C- or better)

Lectures three hours a week.

Business 42.325 ★

Marketing Communications

Study of promotion as a communication process and a tool of marketing management. The course examines the planning of a promotional campaign, including budget development, consumer

research in promotion, creative strategy, media strategy, non-product promotion, ethical issues and evaluating the effectiveness of promotional programs.

Prerequisite: Business 42.228 ★ or 42.224 ★ (with a grade of C- or better).

Lectures three hours a week.

Business 42.327 ★

Marketing Research

Topics include research design, questionnaire design, scales, sources of information and error, sampling techniques, basic statistical measures, measures of association, regression, and an overview of multivariate methods. The pragmatic implications of marketing research are stressed, with the use of case studies and actual data analysis.

Prerequisites: Business 42.224 ★ or 42.228 ★ and one of Economics 43.220 or Mathematics 69.266 ★ and 69.267 ★ (with a grade of C- or better in each).

Lectures three hours a week.

Business 42.328 ★

Business-to-Business Marketing

Theories and practice of marketing in business-to-business markets with special emphasis on high technology businesses, including strategic marketing management, buyer behaviour and competitive analysis, sales management, new product management, and international issues.

Prerequisite: Third-year Standing and Business 42.224 ★ or 42.228 ★ (with a grade of C- or better)

Lectures three hours a week.

Business 42.330 ★

Introduction to Operations Management

Activities, mostly managerial, entailed in selecting, designing, operating and controlling and updating production systems.

Precludes additional credit for Business 42.337 ★.

Prerequisites: Business 42.173 or 42.230 ★, one of Economics 43.220 or Mathematics 69.267 ★ (with a grade of C- or better in each).

Lectures three hours a week.

Business 42.332 ★

Management of Quality

Topics include quality in manufacturing and service systems, quality management philosophies, total quality management, quality in product and process design, continuous improvement, reengineering, benchmarking, quality management assessment, and quality assurance, management of quality in the global enterprise.

Prerequisite: Business 42.330 ★ or 42.337 ★ (with a grade of C- or better).

Lectures three hours a week.

Business 42.333 ★

Supply Chain Management

Controlling the flows of material in supplier/manufacturing/distribution systems. Material and capacity requirements planning, manufacturing resource planning, master production scheduling, Just-in-Time, implementation issues, and supply chain management in global enterprises.

Prerequisite: Business 42.330 ★ or 42.337 ★ (with a grade of C- or better).

Lectures three hours a week.

Business 42.334 ★ (ADM 3307)

Business Forecasting

Concepts, techniques and methods used in the private and public sectors to prepare short-term and long-term forecasts. Methods used include time series analysis, econometric models in forecasting, economic indicators, growth models, opinion polling and technology forecasting.

Prerequisites: Enrolment in B.Com. Technology and Operations

Management concentration; and Business 42.330 ★ or 42.337 ★ (with a grade of C- or better).

Business 42.338 ★

Simulation Methods in Business

Computer-based simulation. Specific topics will include generating random observations, problem formulation, simulation model design, implementation using a computer language, and interpretation of simulation output.

Prerequisites: Business 42.142 ★ and 42.230 ★; Economics 43.220 or Mathematics 69.267 ★ (with a grade of C- or better in each).

Lectures three hours a week.

Business 42.340 ★

Database Analysis and Design

Information management, database administration, software design and programming in the database environment. The construction of a database.

Precludes additional credit for Computer Science 95.305 ★.

Prerequisites: Business 42.142 ★ and 42.240 ★ (with a grade of C- or better in each).

Lectures three hours a week.

Business 42.343 ★

Information Systems Analysis

Methods of analysis of computer-based information systems. Requirements analysis; the systems development life cycle; object oriented analysis; analysis of real time systems, and data analysis. Precludes additional credit for Business 42.342 ★ and Engineering 94.310 ★.

Prerequisites: Business 42.102 ★ or 42.104 ★; 42.242 ★ or Computer Science 95.204 ★ (with a grade of C- or better in each).

Lectures three hours a week.

Business 42.344 ★

Information Systems Design

A continuation of Business 42.343 ★. Students will learn techniques to transform analysis into design. Topics will include user interface design, object oriented design, hardware, software and application design, integration and implementation.

Precludes additional credit for Business 42.342 ★.

Prerequisites: Business 42.340 ★ and 42.343 ★ (with a grade of C- or better in each).

Lectures three hours a week.

Business 42.350 ★

Corporate Finance

An examination of the major issues in corporate finance and applied financial management. Topics include: introduction to portfolio theory, the capital asset pricing model, cost of capital, capital structure and dividend policy, lease financing, capital budgeting under uncertainty, mergers and consolidations. (Also listed as Economics 43.350 ★.)

Prerequisites: Business 42.250 ★ or 42.255 ★, Economics 43.202 ★ and one of Economics 43.220 or Mathematics 69.267 ★.

Lectures three hours a week.

Business 42.352 ★

Principles of Investments

Procedures and methods of investment analysis. The stock and bond markets. Government regulation of securities markets. Valuation of common stocks and fixed income securities. Options, warrants, convertibles and commodities. (Also listed as Economics 43.351 ★.)

Prerequisites: Business 42.250 ★ or 42.255 ★ and Economics 43.220 or Mathematics 69.267 ★.

Lectures three hours a week.

Business 42.354 ★

International Finance

Management of corporate finance as it is affected by the require-

ments of international business. Issues related to international acquisitions, global investments, volatile exchange rates and hedging techniques. Role of international markets in financing corporate activity.

Prerequisite: Business 42.250 ★ or 42.255 ★ (with a grade of C- or better).

Lectures three hours a week.

Business 42.360 ★

Small Business Management

Socio-economic functions and activities of the owner-manager entrepreneur and examines the operations and nature of small businesses. Methods and models that are useful in the analysis of a small business enterprise.

Prerequisites: Business 42.224 ★ or 42.228 ★; 42.250 ★ or 42.254 ★ (with a grade of C- or better in each).

Lectures three hours a week.

Business 42.361 ★

Business and Its Environment

Dynamic conditions that influence Canadian business, its organization, management and operations: consumerism and other social groups, technological developments, economic conditions, politico-governmental actions and legislation as well as contemporary issues such as ecology and pollution.

Prerequisites: Economics 43.100 and Business 42.211 ★ (with a grade of C- or better in each).

Lectures three hours a week.

Business 42.362 ★

Designing Organizational Systems: An Overview

Key models and theories of organizational strategy, structure, processes, and effectiveness along with individual and group behavior in organizations are reviewed. Topics covered include organizational structure, organizational goals, organizational effectiveness, leadership, motivation and job design.

Precludes additional credit for Business 42.211 ★ or 42.313 ★. For the purposes of a Minor in Business this course will fulfill the requirement of 42.211 ★.

Prerequisite: Third-year Standing in the B.PAPM program.

Business 42.373 ★

International and Comparative Management

Focus on managing large organizations spanning national boundaries, including both domestic firms with international markets and multinational corporations. Difficulties of maintaining lines of communication and control in international operations in disparate cultural settings.

Precludes additional credit for Business 42.463 ★.

Prerequisites: Second-year standing; Business 42.171 ★ or 42.211 ★ (with a grade of C- or better)

Lectures three hours a week.

Business 42.374 ★

The Environment of International Business

Theories linking environmental factors and business strategy as a conceptual basis for a study of some of the major factors and institutions that shape international business strategy. International trade patterns, regionalization, shifts in international finance, research and development and transnational data flows.

Prerequisites: Third-year Standing; Business 42.171 ★ or 42.211 ★ and 43.100 (with a grade of C- or better in each).

Lectures three hours a week.

Business 42.391 ★

Co-operative Work Term Report 1

A comprehensive report is due on the lessons learned in the first work term.

Prerequisites: Registration in the Co-op Education Option of the Bachelor of Commerce program and permission of the School.

Business 42.392 ★

Co-operative Work Term Report 2

A comprehensive report is due on the lessons learned in the second work term.

Prerequisites: Registration in the Co-op Education Option of the Bachelor of Commerce program, successful completion of 42.391 ★ and permission of the School.

Business 42.393 ★

Co-operative Work Term Report 3

A comprehensive report is due on the lessons learned in the third work term.

Prerequisites: Registration in the Co-op Education Option of the Bachelor of Commerce program, successful completion of 42.392 ★ and permission of the School.

Business 42.394 ★

Co-operative Work Term Report 4

A comprehensive report is due on the lessons learned in the fourth work term.

Prerequisites: Registration in the Co-op Education Option of the Bachelor of Commerce program, successful completion of 42.393 ★ and permission of the School.

Business 42.400 ★

Accounting Theory

Evolution of accounting theory with emphasis on concepts of income and current issues.

Prerequisites: Business 42.202 ★, 42.250 ★ or 42.254 ★; Economics 43.220 or Mathematics 69.267 ★ (with a grade of C- or better in each).

Lectures three hours a week.

Business 42.401 ★

Advanced Topics in Financial Accounting

A review of the standard setting process, the conceptual framework and accounting measurement models. An evaluation of selected current topics of interest.

Prerequisite: Business 42.202 ★ (with a grade of C- or better).

Lectures three hours a week.

Business 42.402 ★

Advanced Accounting Problems

Discussion, analysis, and integration of accounting, auditing, and income tax issues and problems encountered in professional practice. This course builds upon and integrates the knowledge and skills developed in preceding courses.

Precludes additional credit for Business 42.302 ★.

Prerequisite: Business 42.202 ★ (with a grade of C- or better).

Lectures three hours a week.

Business 42.405 ★

Taxation 2: Corporate Tax Management

An intensive review of federal income tax laws and regulations as significant elements in the planning and decision making process of taxable Canadian corporations. Emphasis is placed upon the tax planning function of corporate management and the associated accounting and reporting aspects.

This course builds upon Business 42.305 ★.

Prerequisite: Business 42.305 ★ (with a grade of C- or better).

Lectures three hours a week.

Business 42.407 ★

Auditing I

A course in auditing theory, methodology and application.

Prerequisite: Business 42.202 ★ (with a grade of C- or better).

Lectures three hours a week.

Business 42.408 ★

Cost Management Systems

Discussion of the role of accounting, performance evaluation and

product costing. Attention is directed to the significant changes in the manufacturing environment and the reporting problems arising therefrom.

Precludes additional credit for Business 42.309 ★.

Prerequisite: Business 42.308 ★ (with a grade of C- or better).

Lectures three hours a week.

Business 42.409 ★

Auditing II

Emphasis on the audit of advanced EDP systems, computer-assisted audit techniques and applications of sampling theory to auditing. Topics of current interest will be discussed.

Prerequisites: Business 42.240 ★ or Computer Science 95.108 ★; Business 42.407 ★ (with a grade of C- or better in each).

Lectures three hours a week.

Business 42.413 ★

Organization Design and Restructuring

Effective structuring of business organizations in competitive environment. Evaluation of design alternatives and analysis of success factors. Application of the theories in the context of the management process.

Prerequisites: Business 42.210 ★ or 42.313 ★; 42.211 ★ or 42.311 ★ (with a grade of C- or better in each).

Lectures three hours a week.

Business 42.414 ★

Strategic Human Resources Management

A strategic approach to human resources management designed to enhance the organization's sustaining competitive advantages, innovativeness, core competencies and capabilities, and productivity within a complex and dynamic business environment. Current topics are discussed within the context of the organization's overall vision and corporate strategy.

Prerequisites: Business 42.312 ★; 42.210 ★ or 42.313 ★ (with a grade of C- or better in each).

Lectures three hours a week.

Business 42.415 ★

Organization Development and Change Management

Process and structural theories and methods of organizational development. Issues of organizational renewal and personnel development. Various theories and methods of individual and organizational diagnosis and intervention.

Prerequisites: Third-year standing; Business 42.210 ★ or 42.313 ★; 42.211 ★ or 42.311 ★ (with a grade of C- or better in each).

Lectures three hours a week.

Business 42.416 ★

Practicum in Interpersonal and Team Skills

Skills of supervising and working with other people including such topics as negotiating, dealing with conflict, setting goals, working with groups, and communication. Extensive use of experiential learning.

Prerequisites: Third-year standing in B.Com program; Business 42.210 ★ or 42.313 ★; 42.211 ★ or 42.311 ★ (with a grade of C- or better in each).

Lectures, seminars, and laboratory tutorials three hours a week.

Business 42.417 ★

Managing Workforce Diversity

Issues confronting managers of a diverse workforce. Gender, ethnic diversity, disability, and sexual orientation. Practices which can help organizations to accommodate and benefit from workforce diversity.

Prerequisites: Business 42.312 ★; 42.210 ★ or 42.313 ★ (with a grade of C- or better in each).

Lectures three hours a week.

Business 42.418 ★

Organizational Learning

Contemporary training and development challenges facing individu-

als, organizations, and communities and the role of information technology in enhancing individual and collective skills development, capabilities, core competencies, intellectual capital and competitiveness.

Prerequisites: Business 42.312 ★; 42.210 ★ or 42.313 ★ (with a grade of C- or better in each).

Lectures three hours a week.

Business 42.423 ★

Marketing In Not-for-Profit Organizations

Theories and practices of marketing in not-for-profit organizations including government. Similarities and differences between marketing in not-for-profit and for-profit organizations and the key issues faced by marketers in developing marketing strategies in not-for-profit organizations will be examined.

Prerequisite: Third-year Standing and Business 42.224 ★ or 42.228 ★ (with a grade of C- or better)

Lectures three hours a week.

Business 42.425 ★

International Marketing

The marketing function in international markets from a managerial perspective. Environments of foreign markets in relation to the marketing management functions of product, price, distribution and communication strategy and marketing research. International expansion methods, joint ventures and other business alliances, and international marketing.

Prerequisites: Third-year standing; Business 42.224 ★ or 42.228 ★ (with a grade of C- or better)

Lectures three hours a week.

Business 42.426

Consumer Behaviour

The traditional socio-psychological theories of consumer behaviour. Current literature and the fundamental theories and concepts from various disciplines. Motivation, personality, perception, learning, communication of innovations, attitude theory, role theory, life style analysis, consumerism, etc.

Prerequisites: Third-year standing, and Business 42.228 ★ (with a grade of C- or better).

Lectures three hours a week.

Business 42.428 ★

Marketing Management

This course emphasizes the "managerial" aspects of marketing. Such topics as: market segmentation, social and regulatory aspects in marketing, channels of distribution, industrial marketing, sales force management and other current topics are discussed in detail.

Prerequisite: One of Business 42.325 ★ or 42.327 ★ (with a grade of C- or better in each prerequisite).

Lectures three hours a week.

Business 42.435 ★

Operations Research II

Dynamic programming, inventory models, queuing, simulation, non-linear programming. (Also listed as Economics 43.405 ★.)

Prerequisites: Third-year standing; Business 42.230 ★ or Economics 43.404 ★ or Mathematics 69.381 ★; Economics 43.220 or Mathematics 69.267 ★ (with a grade of C- or better in each).

Lectures three hours a week.

Business 42.436 ★

Introduction to Statistical Decision Theory

Examination of Bayesian approaches to decision-making under uncertainty for individuals and firms.

Precludes additional credit for Business 42.439 and Economics 43.407 ★.

Prerequisites: Economics 43.202 ★; and Economics 43.220 or Mathematics 69.267 ★ (with a grade of C- or better in each).

Lectures three hours a week.

Business 42.437 ★

Applications of Statistical Decision Theory in Business

Statistical Decision Theory-based approach to the Theory of Information Systems and other applications of Statistical Decision Theory to Business decision making.

Prerequisite: Business 42.436 ★ (with a grade of C- or better).

Lectures three hours a week.

Business 42.438 ★

Construction/Project Management

Systems approach to project planning and control. Analysis of alternative network planning methods: CPM, precedence and PERT; planning procedure; computer techniques and estimating; physical, economic and financial feasibility; implementation feedback and control; case studies. (Also listed as Civil and Environmental Engineering 82.440 ★.)

Prerequisite: Fourth-year standing.

Lectures three hours a week, problem analysis three hours alternate weeks.

Business 42.440 ★

Management of Information Systems

Comprehensive treatment of current trends and management issues associated with information systems within organizations of local, national and international scope. Issues and techniques of information systems planning, administration, resource management and new technology adoption. Case studies are used.

Prerequisites: Fourth-year standing, Business 42.210 ★ or 42.313 ★ and one of Business 42.240 ★ or Computer Science 95.204 ★ (with a grade of C- or better in each prerequisite).

Lectures three hours a week.

Business 42.442 ★

Information Systems Analysis and Design Practicum

Students form teams for the purpose of designing and implementing a typical business information system. Projects are drawn from actual problems suggested by local business and institutions.

Prerequisites: Business 42.340 ★ or Computer Science 95.304 ★ (with a grade of C- or better), and Business 42.343 ★ (with a grade of B- or better).

Lectures three hours a week.

Business 42.444 ★

Telecommunications: A Management Perspective

This course addresses the challenges and issues managers face in coordinating telecommunications and data networking services delivery to their organizations. It explores technical and managerial aspects of data communications, local, wide-area, and wireless networks, network protocols, Internet/intranets, client/server computing, network security and management.

Prerequisites: Third-year standing and Business 42.240 (with a grade of C- or better).

Lectures three hours a week.

Business 42.446 ★

Decision Making and Support Systems

Framework, processes and technology components for building decision support systems. Planning and organizing for DSS, system design and integrating DSS into the organization. Group support systems, negotiation support systems, meeting and teleconferencing systems, knowledge based systems and artificial intelligence. High-level modelling languages are used.

Prerequisites: Business 42.230 ★ and one of Business 42.240 ★ or Computer Science 95.204 ★ (with a grade of C- or better in each).

Lectures three hours a week.

Business 42.447 ★

Technology Project Management

Organizational, managerial and technical issues of information

system and technology industry projects. Defining and setting up successful projects. Characteristics of successful project managers. Tracking and monitoring. Estimation techniques. Risk analysis. Learning from projects. Examples and case studies.

Prerequisites: Business 42.330 ★ or 42.337 ★; 42.240 ★ (with a grade of C- or better in each).

Lectures three hours a week.

Business 42.450 ★

Advanced Corporate Finance

An in-depth examination of some of the major theoretical issues in corporate finance. This course requires analyses and presentations of both articles from the finance literature and case studies. (Also listed as Economics 43.408 ★.)

Prerequisite: Business 42.350 ★ (with a grade of C- or better).

Lectures three hours a week.

Business 42.452 ★

Investment Management

Analysis of investment requirements for individuals and institutional investors: liquidity, risk and return; portfolio design, construction, management and control; performance measurement; capital market theory. (Also listed as Economics 43.411 ★.)

Prerequisite: Business 42.352 ★ (with a grade of C- or better).

Lectures three hours a week.

Business 42.453 ★

Capital Markets

Analysis of money and capital markets and instruments used in these markets; term structure of interest rates; derivation and implication of yield curve in financial markets; risk and investment decisions in capital markets; foreign currency exchange markets and instruments. Mathematical tools are employed in the exposition of most topics. (Also listed as Economics 43.410 ★.)

Prerequisites: Economics 43.202 ★, 43.203 ★, 43.212 ★, and 43.220 or 69.267 ★ (a grade of C- or better in each).

Lectures three hours a week.

Business 42.461 ★

Business Ethics

Use of ethical reasoning to analyse business decisions. The ethical content of these decisions. The role of ethics in business situations. Practice in ethical reasoning. Major ethical systems.

Prerequisite: Fourth-year standing in B.Com. or B.I.B. program.

Seminars three hours a week.

Business 42.462 ★

Women in Management

Organizational and personal challenges arising from changing gender roles and the increased participation of women in management and professional organizational roles.

Prerequisites: Third-year standing; Business 42.211 ★ or 42.311 ★; 42.210 ★ or 42.313 ★ or Women's Studies 09.188 (with a grade of C- or better in each).

Lectures three hours a week.

Business 42.464 ★

The Business Environment in East/Central Europe and the Soviet Successor States

An examination of the economic and legal environment in which new businesses are emerging in the region and the practical problems which face business ventures. Regulatory structures, patterns of foreign trade, market characteristics, scientific and technological base and business culture. (Also listed as East European Studies 55.406 ★.)

Prerequisites: Business 42.361 ★ or Economics 43.370 ★, or permission of the School.

Seminar three hours a week.

Business 42.467 ★

Management of Technology and Innovation

Integration of technology and strategy; the design of technological strategy; the development of new business around new technology; and the management of corporate research and development, including pre-competitive consortia.

Prerequisites: Third-year standing; Business 42.224 ★ or 42.228 ★; 42.311 ★ or 42.313 ★ (with a grade of C- or better in each).

Lectures three hours a week.

Business 42.468 ★

History of Business in Canada 1850-1980

The place of business in Canadian society, economics and politics. The internal dynamics of Canadian business, and its external implications. Students apply a historical perspective to issues and problems in the contemporary business environment. (Also listed as History 24.325 ★.)

Prerequisite: Fourth-year standing in B.Com. or B.I.B.

Business 42.469 ★

Strategic Management

Analysis and evaluation of the organization's corporate and business strategies; integration and synthesis of knowledge acquired in the program by application of acquired functional skills to strategic decision making.

Precludes additional credit for Business 42.479 ★.

Prerequisite: Fourth-year standing in B.Com.

Lectures three hours a week.

Business 42.471 ★

Cross-Cultural Communication

Focus on effective cross-cultural communication. Readings, discussions, and activities build on experiential learning from the student's year of study abroad.

Prerequisite: Fourth-year standing in the B.I.B. program.

Workshop and discussion three hours a week.

Business 42.474 ★

Workshop on International Management and Global Business

A particular managerial field from an international perspective. Possible topics include personnel management in the global firm, international information systems, international logistics, and international research and development.

Prerequisite: Third-year standing in B.Com. or B.I.B. program.

Lectures three hours a week.

Business 42.479 ★

Strategic Management for International Business

Analysis and evaluation of the organization's global and national strategies. Emphasis on firms' market-entry strategies and on the unique problems of managing in distant and different cultures.

Precludes additional credit for Business 42.469 ★.

Prerequisites: Fourth-year standing in B.I.B. or B.Com., International Business Concentration.

Lectures three hours a week.

Business 42.480 ★

Business Case Analysis

Analysis, solution, and presentation of business cases in a competitive environment focusing on a specific functional area, choosing from a number of functional areas. Participation in the Annual (Canadian) Inter-Collegiate Business Competition.

Prerequisites: Enrolment in B.Com. or B.I.B. program; and permission of the School.

Flexibly scheduled meetings and workshops with faculty.

Business 42.481 ★

Selected Topics: Workshop in Urban Studies

Study of one specific aspect of architecture in the area of urban studies. Workshop offerings change from year to year. (Also listed as Architecture 78.392 ★.)

Prerequisite: Fourth-year B.Com. or B.I.B.

Workshop six hours a week.

Business 42.490 ★

Auditing III

This course reviews the fundamental role of auditing and develops an understanding of issues and challenges facing the profession such as comprehensive auditing and auditing small businesses and non-profit organizations. Integration of topics from this course and its prerequisites is accomplished primarily through applications problems.

Prerequisite: Business 42.407 ★ (with a grade of C- or better).

Business 42.491 ★

Topics in Management Studies I

For 1999-2000, the topic is: Negotiation Management and Conflict Resolution. Management, analysis and support of negotiation processes in the contexts of traditional trading, electronic commerce, international and cross-cultural business. Includes negotiation models and systems, principled and win/win negotiation, bargaining, conflict resolution, negotiating agents, computer support, negotiation and group decision support systems.

Precludes additional credit for Business 42.460 ★ (if taken in 1998-99).

Prerequisite: Business 42.317 ★ (with a grade of C- or better) or permission of the School.

Lectures three hours a week.

Business 42.492 ★

Topics in Management Studies II

A selected topics course in a concentration area that may be offered. Eligibility for this course to serve as an option for a specific concentration is to be established by the School.

Prerequisite: Permission of the School.

Business 42.494

Directed Studies I

This course is intended to provide qualified students with the opportunity of carrying out a major research project under the supervision of a faculty member. Students should enquire about procedures for Directed Studies, and about the possibility of counting this credit toward a specified concentration's requirements, in advance of the term in which they intend to register for the course.

Prerequisites: GPA of 10.0 or better and permission of the School.

Business 42.495 ★

Directed Studies II (Term Paper)

This course provides qualified students with the opportunity of carrying out a minor (one-term) research project under the supervision of a faculty member. Students should enquire about procedures for Directed Studies, and about the possibility of counting this credit toward a specified concentration's requirements, in advance of the term in which they intend to register for the course.

Prerequisites: GPA of 10.0 or better and permission of the School.

Canadian Studies (Arts and Social Sciences)

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General Information

The undergraduate program in Canadian Studies offers students a broad, interdisciplinary view of Canada while at the same time allowing them to pursue disciplinary training in other departments within the Faculties of Arts and Social Sciences or Public Affairs and Management if they so desire. Canadian Studies offers Combined B.A. (Honours) and B.A. programs or a Minor in Canadian Studies.

The program forms the undergraduate division of the School of Canadian Studies and, like the graduate division of the School, it draws on a wide range of experts on Canada found throughout the University. It also benefits from Carleton University's situation in Canada's capital and the richness of material available in Ottawa for such studies.

The core program focuses on the creative tensions of diversity, encouraging a broad understanding of Canadian history, culture and society. At the same time, it provides the opportunity to study the relationships among various aspects of Canada in some depth.

Graduation Regulations

In order to graduate, students must fulfill all University graduation regulations (see p. 48), all Faculty regulations including those relating to First-Year Seminars and Breadth requirements (see p. 63), in addition to all Committee regulations and requirements as set out below.

Combined B.A. (Honours) Program

Core Credits

The Combined B.A. (Honours) program in Canadian Studies requires a core of the following 5.0 credits:

1. Canadian Studies 12.100;
2. French 20.106, 20.145 or Linguistics and Applied Language Studies 23.190;
3. Canadian Studies 12.200 or 12.288;
4. Canadian Studies 12.302;
5. Canadian Studies 12.402.

With the permission of the Undergraduate Supervisor, students with advanced proficiency in the French language may substitute, for the language requirement, another 1.0 credit in Quebec culture or society that is taught in French.

Program Electives

In addition to the 5.0 core credits, the Canadian Studies Combined B.A. (Honours) program requires the following 3.0 credits:

1. 1.0 credit from the following list:
Art History 11.202 ★; 11.300 ★; 11.301 ★;
English 18.282; 18.381 ★; 18.383 ★;
Economics 43.335
French 20.270; 20.372 ★; 20.383 ★;
Geography 45.320 ★; 45.255 ★; 45.335;
History 24.233; 24.234; 24.235;
Political Science 47.200; 47.201;
Sociology-Anthropology 56.220.

2. 1.0 arts and 1.0 social science credit from the list of courses with substantial Canadian content on p. 171, one of which must be at the 400-level.

The same course may not be used to satisfy more than one of the alternative French requirements for core courses and the requirements for program electives.

B.A. Program

Core Credits

The B.A. program in Canadian Studies requires a core of the following 4.0 credits:

1. Canadian Studies 12.100;
2. French 20.106, 20.145 or Linguistics and Applied Language Studies 23.190;
3. Canadian Studies 12.200 or 12.288;
4. Canadian Studies 12.302.

With permission of the Undergraduate Supervisor, students with advanced proficiency in the French language may substitute, for the language requirement, another 1.0 credit in Quebec culture or society that is taught in French. Carleton University courses that may normally be used for this purpose are: French 20.270, 20.372 ★ and 20.383 ★.

A GPA of 4.0 or better must be achieved in the required credits of the program core.

Program Electives

In addition to the 4.0 core credits, the Canadian Studies B.A. program student must take the following 6.0 credits:

1. 1.0 arts credit and 1.0 social science credit from the following list:

Arts

Art History 11.202 ★; 11.300 ★; 11.301 ★;
English 18.282; 18.381 ★; 18.383 ★;
French 20.270; 20.372 ★; 20.383 ★;
History 24.233; 24.234; 24.235.

Social Sciences

Economics 43.335
Geography 45.255 ★; 45.320 ★; 45.335;
Political Science 47.200; 47.201;
Sociology-Anthropology 56.220.

2. 1.0 arts credit and 1.0 social science credit from the list of courses with substantial Canadian content.

3. 2.0 additional credits with substantial Canadian content.

At least two of the program electives must be above the 200-level.

The same course may not be used to satisfy more than one of the alternative French requirements for core courses and the requirements for program electives.

Minor in Canadian Studies

Students registered in B.A. (Honours) or B.A. programs may obtain a Minor in Canadian Studies by completing the 4.0 credits specified below, with a minimum G.P.A. of 6.5.

1. 3.0 credits chosen from 12.100, 12.200, 12.288, 12.302, 12.380 12.381 ★, 12.382 ★, 12.383 ★.

2. 1.0 credit chosen from the list of Courses with Substantial Canadian Content Offered within the Faculties of Arts and Social Sciences and Public Affairs and Management on p. 171. These credits may not be chosen from the student's Major(s).

Mention: français

Students who wish to qualify for the "Mention: français" notation (see p. 51) in Canadian Studies may do so by fulfilling the requirements listed below, in consultation with the Undergraduate Supervisor. Courses taken for the "Mention: français" notation may be used to fulfill B.A.(Honours) and B.A. degree requirements.

Courses taught in French at the University of Ottawa, or at another university, which are approved by the Undergraduate Supervisor, may be used to satisfy the "Mention: français" requirements. Students who wish to enrol in University of Ottawa courses for this purpose must do so through the University of Ottawa Exchange Agreement. To enrol in courses in French at another university a letter of permission is required. (See articles 3.12 and 3.13, on p. 75.)

Combined Honours Program

To graduate with the notation "Mention: français" students must include the following courses in their degree program:

1. 1.0 credit in the advanced study of the French language.
2. 1.0 credit in French-Canadian culture and heritage such as French 20.270, or 20.372 ★ and 20.383 ★ or a course in another appropriate discipline, given in French, which is approved by the Undergraduate Supervisor. Courses from the University of Ottawa or another university must be approved by the Undergraduate Supervisor.
3. 1.0 credit on a Canadian subject at the 200- or 300-level, taught in French, in any appropriate discipline. For Carleton University courses that may be used to fulfil this requirement, consult the list of courses with substantial Canadian content (p. 171). Courses from the University of Ottawa or another university must be approved by the Undergraduate Supervisor.

4. 1.0 credit on a Canadian subject at the 400-level, taught in French, including either Canadian Studies 12.493 ★ and 12.494 ★, or a directed studies, tutorial, research paper, or course in any appropriate discipline.

All written work must be submitted in French. Note that directed studies, tutorials, and research papers are weighted differently in various departments. Courses from the University of Ottawa or another university must be approved by the Undergraduate Supervisor.

5. Combined Honours program students must meet the "Mention: français" requirements of both disciplines.

B.A. Program

To graduate with the notation "Mention: français" students must include the following courses in their degree program:

1. 1.0 credit in the advanced study of the French language.
2. 1.0 credit in French-Canadian culture and heritage such as French 20.270, or 20.372 ★ and 20.383 ★, or a course in another appropriate discipline, given in French, which is approved by the Undergraduate Supervisor. Courses from the University of Ottawa or another university must be approved by the Undergraduate Supervisor.
3. 1.0 credit on a Canadian subject at the 200- or 300-level, taught in French, in any appropriate discipline. For Carleton University courses that may be used to fulfill this requirement, consult the list of courses with substantial Canadian content (p. 171). Courses from the University of Ottawa or another university must be approved by the Undergraduate Supervisor.

Requirement for Breadth, for Students in B.A. or B.A. (Honours) degrees

Category for Breadth	Courses in this unit
The temporal dimension of human societies, analyzing times before the present era or societies other than our own	
The artifacts of the imagination in literature and/or other forms, or that addresses the life of the imagination and culture.	
The understanding of social, technological and/or natural processes and the ways in which that understanding is obtained in science and social science.	All courses in Canadian Studies
Matters of human values, ethics and social responsibilities	

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

First-Year Seminar in Canadian Studies 01.146

How Ottawa Works: Exploring National Institutions

This course examines the fundamental political, judicial and administrative institutions which made Canada a unique nation. Students will learn how government institutions are dealing with preservation and maintenance of Canadian cultural and social values. Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminar three hours a week.

First-Year Seminar in Canadian Studies 01.149

Social Change in Canada

Interdisciplinary examination of contemporary movements involved in social change. Assessment of opportunities and constraints for political activism in Canada today. Focus on movements active around the environment, labour, feminism, gay and lesbian rights, racism, poverty and peace.

Prerequisite: Normally restricted to students entering the First year of Bachelor of Arts program.

Seminar three hours a week

Canadian Studies 12.100

Introduction to Canadian Studies

Introduction to interdisciplinary Canadian Studies. Issues from Canada's past and present. Topics may include: original peoples, language and ethnicity, communications and technology, immigration, arts and culture, economics, environmentalism, regionalism, gender, Quebec and English Canada and international relations. Two hour lecture and one hour discussion group a week.

Canadian Studies 12.200

Culture, Identity and Community in Canada

Using an interdisciplinary approach, this course explores the composition and diversity of cultures in Canada with a particular emphasis on Aboriginal issues. Aspects of social and material cultures, citizenship and the politics of multiple identities are addressed.

Prerequisite: Canadian Studies 12.100.

Two hour lecture and one hour discussion group a week.

Canadian Studies 12.288

Contemporary English-Canadian and French-Canadian Literature

This course, which is offered by faculty members from the Departments of French, and English Language and Literature, provides a general introduction to and comparison of the two major literatures of Canada. Lectures are given in both English and French. (Also listed as English 18.288.)

Prerequisites: A basic reading knowledge of French, and Second-year standing.

Three hours a week.

Canadian Studies 12.302

Canadian Studies Seminar

This course is designed to allow the student to bring together the knowledge acquired in the various disciplines of the program. Each year a different topic or topics are explored in an interdisciplinary perspective. The topic for 1999-2000: Canada in a Post Industrial World.

Prerequisite: Third-year standing in Canadian Studies or permission of the School.

Seminar three hours a week.

Canadian Studies 12.350 ★

Canada in the Global Village

Canada's development as a series of technological projects - from fur-trading routes to canals, railways and telegraphs, radio and television and now, the information highway. Critiques the dominant discourse on Canadian technology - alternately technology as progress and technological dependency.

Precludes additional credit for Canadian Studies 12.402 (if taken before Fall 1997.)

Prerequisite: Canadian Studies 12.100.

One hour per week of video-based documentary on ITV and one hour a week of instructor-led electronic discussion.

Canadian Studies 12.380

Internship Practicum

A limited number of internships and practicum placements are available in institutional settings, primarily in the Ottawa area. Students are required to submit a formal written report concerning their placement. The written work is evaluated jointly by the student's internal and placement supervisors. A maximum of 1.0 credit of internship/practicum may be offered in fulfilment of Canadian Studies requirements.

Prerequisite: Permission of the School.

Canadian Studies 12.381 ★

Internship/Practicum

For course description, see Canadian Studies 12.380.

Prerequisite: Permission of the School.

Canadian Studies 12.382 ★

Internship/Practicum

For course description, see Canadian Studies 12.380.

Prerequisite: Permission of the School.

Canadian Studies 12.383 ★

Internship/Practicum

For course description, see Canadian Studies 12.380.

Prerequisite: Permission of the School.

Canadian Studies 12.402

Canadian Studies Seminar

This course is designed to allow the Honours student to engage in research and class discussion on topics of an interdisciplinary nature. In 1999-2000, the course in the first term will consider theoretical approaches and methodological strategies in Canadian Studies; the second term will focus on issues of community development.

Seminar three hours a week.

Canadian Studies 12.491 ★

Selected Problems in Canadian Studies

The choice of topics varies from year to year.

Prerequisite: Permission of the School.

Canadian Studies 12.492 ★

Selected Problems in Canadian Studies

The choice of topics varies from year to year.

Canadian Studies 12.493 ★

Études dirigées I

Cours facultatif offert seulement aux étudiants de quatrième année Honours en Études canadiennes ("Mention: français"). Ce cours comprend des lectures dirigées et des travaux écrits dans un domaine relié aux Études canadiennes.

Prerequisite: Permission of the School.

Canadian Studies 12.494 ★

Études dirigées II

Cours facultatif offert seulement aux étudiants de quatrième année Honours en Études canadiennes ("Mention: français"). Ce cours comprend des lectures dirigées et des travaux écrits dans un domaine relié aux Études canadiennes.

Prerequisite: Permission of the School.

Canadian Studies 12.495 ★

Directed Studies I

An optional course normally restricted to Fourth-year Honours students in Canadian Studies and to Qualifying-year Graduate students. Includes supervised reading and written work in a Canadian Studies area.

Prerequisite: Permission of the School.

Canadian Studies 12.496 ★

Directed Studies II

An optional Course normally restricted to Fourth-year Honours students in Canadian Studies and to Qualifying-year Graduate students. Includes supervised reading and written work in a Canadian Studies area.

Prerequisite: Permission of the School.

Canadian Studies 12.497

Directed Studies III

An optional course normally restricted to Fourth-year (Honours) students in Canadian Studies and to Qualifying-year Graduate students. Includes supervised reading and written work in a Canadian Studies area.

Prerequisite: Permission of the School.

**Courses with Substantial Canadian Content
Offered within Arts and Social Sciences and Public
Affairs and Management**

Art History

11.202 ★, 11.205 ★, 11.206 ★, 11.300 ★, 11.301 ★, 11.302 ★, 11.314 ★, 11.362 ★, 11.400, 11.404 ★, 11.405 ★

Economics

43.235, 43.325, 43.330 ★, 43.335, 43.341 ★, 43.344 ★, 43.347 ★, 43.348 ★, 43.357 ★, 43.367 ★, 43.380 ★, 43.436 ★, 43.385 ★, 43.410 ★, 43.441 ★, 43.442 ★

English Language and Literature

18.288, 18.282, 18.381 ★, 18.383 ★, 18.482 ★, 18.483 ★, 18.486 ★, 18.488 ★

Film Studies

19.229, 19.329 ★, 19.429 ★

French

20.270, 20.372 ★, 20.383 ★, 20.472 ★

Geography

45.255 ★, 45.313 ★, 45.320 ★, 45.326 ★, 45.335, 45.336 ★, 45.351 ★, 45.404 ★, 45.430, 45.431 ★, 45.435 ★, 45.436

History

24.130, 24.233, 24.234, 24.235, 24.322 ★, 24.324, 24.325 ★, 24.328 ★, 24.329 ★, 24.330 ★, 24.331 ★, 24.332 ★, 24.333 ★, 24.334 ★, 24.335, 24.336 ★, 24.337 ★, 24.339 ★, 24.350 ★, 24.351 ★, 24.353, 24.354, 24.356 ★, 24.357 ★, 24.362 ★, 24.421, 24.422, 24.424, 24.426, 24.430, 24.431, 24.433, 24.434, 24.437, 24.438, 24.439

Italian

26.262

Journalism

28.251 ★, 28.352 ★

Law

51.100, 51.203, 51.204, 51.205, 51.301 ★, 51.303 ★, 51.336 ★, 51.337 ★, 51.341 ★, 51.342 ★, 51.345 ★, 51.348 ★, 51.350 ★, 51.351 ★, 51.352 ★, 51.353 ★, 51.354 ★, 51.356 ★, 51.358 ★, 51.359 ★, 51.374 ★, 51.380 ★, 51.384, 51.406 ★, 51.412 ★, 51.435 ★, 51.438 ★, 51.439 ★, 51.442 ★, 51.445 ★, 51.454 ★, 51.457 ★, 51.467 ★

Linguistics and Applied Language Studies

23.190, 29.271 ★, 29.274 ★

Mass Communication

27.211, 27.251 ★, 27.352 ★

Music

30.313 ★, 30.314 ★, 30.332 ★, 30.414 ★, 30.433 ★

Political Science

47.105 ★, 47.112 ★, 47.115 ★, 47.200, 47.201, 47.300 ★, 47.301 ★, 47.302 ★, 47.303 ★, 47.304 ★, 47.305 ★, 47.306 ★, 47.307 ★, 47.319 ★, 47.335 ★, 47.336 ★, 47.341 ★, 47.342 ★, 47.346 ★, 47.350 ★, 47.366 ★, 47.367 ★, 47.400, 47.402 ★, 47.403 ★, 47.405 ★, 47.406 ★, 47.407 ★, 47.408 ★, 47.409 ★, 47.410 ★, 47.411 ★, 47.416 ★, 47.417 ★, 47.418 ★, 47.419 ★, 47.426 ★, 47.441 ★, 47.447 ★

Social Work

52.412 ★, 52.413 ★, 52.423 ★, 52.424 ★

Sociology and Anthropology

56.220, 56.241, 53.247, 53.252 ★, 53.256 ★, 54.318 ★, 54.319 ★, 56.320, 56.327 ★, 53.373 ★, 53.380, 56.430 ★, 56.451 ★, 53.452 ★, 56.456 ★, 56.465 ★, 54.470 ★

Women's Studies

09.188, 09.280 ★, 09.491 ★, 09.492 ★

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Adjunct Professors

R.H. Wightman • **D.R. Wiles**

Sessional Lecturer

P. Wolff

General Information

Students intending to enter a program in Chemistry should have a strong background in mathematics and physics as well as in chemistry. The four-year Honours and three-year Major programs in Chemistry are described below. Students interested in continuing their careers in secondary school teaching, graduate studies or as professional chemists are advised to enrol in the Honours program.

Combined Honours programs in Chemistry and Computer Science, Chemistry and Geology and Chemistry and Physics are available as described below.

While Combined Honours in Chemistry and Mathematics are not formally available, strong continuation groupings in Mathematics can be arranged under the Honours Chemistry program. Secondary specialization in Biology can be arranged under the Honours Chemistry program, or under the joint program in Honours Biochemistry. A strong Chemistry component is possible also within the degree programs for Integrated Science Studies or Environmental Science. In evaluating students for entry with advanced standing, the Department of Chemistry transfers credits but not grades.

Graduation Regulations

In order to graduate, students must fulfill all University graduation regulations (see p. 48) and all Faculty regulations (see p. 109), in

addition to all departmental regulations and requirements as set out below.

The designation of Honours degree awarded for students in the Combined Honours program is determined on the basis of their GPA for all required credits in the two Major subjects as specified in the respective program requirements.

For students in the Honours program, the designation of Honours degree will be determined by a student's GPA on all required Chemistry courses.

Honours Program

The total program (including First year) must contain:

1. Chemistry 65.100, 65.211 ★, 65.212 ★, 65.223 ★, 65.224 ★, 65.232 ★, 65.233 ★, 65.311 ★, 65.321 ★, 65.353 ★, 65.354 ★, 65.355 ★, 1.0 credit from 65.315 ★, 65.325 ★ and 65.335 ★, 1.0 credit at the 400-level in Chemistry or Biochemistry 63.310, 0.5 credit at the 300- or 400-level in Chemistry and Chemistry 65.498;
2. Mathematics 69.107 ★, 69.117 ★, 69.207 ★ and an additional 0.5 Mathematics credit at the 200-level;
3. Physics 75.101 ★ and 75.102 ★;
4. 0.5 Science Continuation credit not in Chemistry;
5. Computer Science 95.104 ★ or approved equivalent;

6. 1.0 First-year Science credit (as required in the First-year program);
7. 2.0 arts or social science credits (see Faculty of Science regulations);
8. 2.0 additional Science credits. Normally these will be chosen either from non-compulsory Chemistry courses or other science continuation courses. Students who wish to broaden and strengthen a non-Science interest by substituting non-Science courses must obtain written permission from the Undergraduate Adviser prior to registration;
9. 1.0 free credit.

Honours Project

All Honours candidates are required, as part of Chemistry 65.498, in the Fourth-year to carry out a substantial project and to write a report to their supervisor. Towards the end of the Third year, prospective candidates should obtain pertinent information from the 65.498 coordinator. Brief progress reports are to be presented to the supervisor and committee members early in November and February. The deadline for submission of the final typed report is the first Monday in April. Honours students are also expected to attend departmental seminars in their specialty. Prior to beginning the Honours Project, two of the four Third-year laboratory courses, 65.315★, 65.325★, 65.335★ and 65.355★ must be successfully completed. Any exception to this regulation will only be considered on the submission of a written appeal to the Department.

Honours in Computational Chemistry

First Year

Chemistry 65.100;
Computer Science 95.102★, 95.105★, 95.106★;
Mathematics 69.107★, 69.117★;
Biology 61.103★;
Physics 75.101★;
0.5 arts or social science credit.

Second Year

Chemistry 65.211★, 65.212★, 65.223★, 65.226★;
Computer Science 95.202★, 95.203★, 95.204★;
Mathematics 69.207★;
1.0 arts or social science credit.

Third Year

Chemistry 65.311★, 65.312★, 65.316★, 65.321★, 65.353★, 65.354★;
Computer Science 95.304★;
Biochemistry 63.310;
0.5 arts or social science credit.

Fourth Year

Chemistry 65.446★; 0.5 credit Chemistry or Biochemistry at the 300- or 400-level; 0.5 credit Chemistry or Biochemistry at the 400-level;
Computer Science 95.305★ or 95.386★, 0.5 credit at the 300- or 400-level;
Computational Science 68.499;
0.5 Science Option credit;
1.0 Free elective credit.

Honours Chemistry with a Minor in Business

This program is intended for students interested in an honours chemistry program who wish to keep open a business option. Like the Honours Chemistry program it is accredited by the Chemical Society of Canada and thus will allow entry into graduate schools in chemistry.

The Minor will be earned through completion of 5.0 specified business credits with a GPA of 6.0 or better. On successful comple-

tion of all requirements, the designation "Minor in Business" will be added to the transcript and degree certificate.

The program requirements are as follows:

1. Chemistry 65.100, 65.211★, 65.212★, 65.223★, 65.224★, 65.232★, 65.233★, 65.311★, 65.321★, 65.353★, 65.354★, 65.355★, 1.0 credit from 65.315★, 65.325★ and 65.335★, 1.0 credit at the 400-level in Chemistry or Biochemistry 63.310; 0.5 credit at the 300- or 400-level in Chemistry, and Chemistry 65.498;
2. Mathematics 69.107★, 69.117★, 69.207★ and an additional 0.5 Mathematics credit at the 200-level;
3. Physics 75.101★ and 75.102★;
4. 0.5 Science Continuation credit not in Chemistry;
5. Computer Science 95.104★ or approved equivalent;
6. 1.0 First-year Science credit (as required in the First-year program);
7. Business 42.101★, 42.102★, 42.211★, 42.224★, 42.240★, 42.254★ and 2.0 other Business credits for which the student has the required prerequisites.

Note: Possible Business electives depending on the prerequisites are listed under the School of Business (p. 160). However, Business 42.230★ and 42.308★ may not be taken for credit in this program.

Combined Honours in Chemistry and Computer Science

A GPA of 6.5 or better must be maintained in both Chemistry and Computer Science courses along with a GPA of 5.0 or better overall to remain in the program.

First Year

Chemistry 65.100;
Computer Science 95.102★, 95.105★, 95.106★;
Mathematics 69.107★, 69.117★;
Biology 61.103★;
Physics 75.101★;
0.5 arts or social science credit.

Second Year

Chemistry 65.211★, 65.223★, 65.226★;
Computer Science 95.202★, 95.203★, 95.204★;
Mathematics 69.207★, 69.217★;
1.0 arts or social science credits.

Third Year

Chemistry 65.311★, 65.312★, 65.316★, 65.353★, 65.354★;
Computer Science 95.300★, 95.304★;
Biochemistry 63.310;
0.5 arts or social science credit.

Fourth Year

Chemistry 65.321★, 65.446★;
Computer Science 95.305★, 95.384★, 95.386★, 0.5 credit at the 400-level;
Computational Science 68.499 or Computer Science 95.495★ and 0.5 credit at the 400-level in Computer Science;
1.0 Free elective credit.

Combined Honours in Chemistry and Geology

Program Advisers: R.A. Shigeishi and G.B. Skippen.

A grade of C+ or better in both Chemistry 65.100 and Geology 67.100 and overall Honours standing are required for admittance to the program. Program requirements are as follows:

1. Chemistry 65.100, 65.211★, 65.212★, 65.232★, 65.233★, 65.353★, 65.354★ and 1.0 Chemistry credit at the 400-level;
2. Geology 67.100, 67.223★, 67.225★, 67.228★, 67.281★ and 1.0 Geology credit at the 400-level;

3. Either Chemistry 65.498 or Geology 67.498. Students should consult their program adviser about selection of this in their Third year;
4. 1.0 Chemistry or Geology credit;
5. Mathematics 69.107★, 69.117★, 69.207★ and an additional 0.5 Mathematics credit at the 200-level;
6. Physics 75.101★ and 75.102★; or approved equivalents;
7. 2.0 Science credits, of which one must be outside Chemistry and Geology;
8. 2.0 arts or social science credits;
9. 1.0 free credit;
10. A language requirement must be met during the Third year by passing a course in, or demonstrating reading proficiency in one of French, German or Russian.

A typical program is as follows:

First Year

Chemistry 65.100;
Geology 67.100;
Mathematics 69.107★ and 69.117★;
Physics 75.101★ and 75.102★;
1.0 arts or social science credit.

Second Year

Chemistry 65.211★, 65.212★ and 65.232★, 65.233★;
Geology 67.223★, 67.225★, 67.228★ and 67.281★;
Mathematics 69.207★ and 0.5 Mathematics credit at the 200-level.

Third Year

Chemistry 65.353★ and 65.354★;
Geology 67.323★ and 67.324★;
1.0 Chemistry or Geology credit;
1.0 Science credit;
1.0 arts or social science credit.

Fourth Year

Chemistry 65.498 or Geology 67.498;
1.0 Chemistry credit at the 400-level;
1.0 Geology credit at the 400-level;
1.0 Science credit;
1.0 elective credit.

Combined Honours in Chemistry and Physics

This program combines elements of Honours Chemistry and Honours Physics. Students in this program may apply to the Co-operative Education Option, described below.

Entrance Criteria

Refer to the Faculty of Science regulations for entry into Honours programs (p. 109). Students from Ontario high schools must have OAC Physics, OAC Calculus, and OAC Chemistry.

Entrance after First Year and continuation at the end of First Year in the program requires: Honours standing and a grade of C+ or better in each of Physics 75.101★, 75.102★, and Chemistry 65.100.

Course Requirements

First Year

Physics 75.101★, 75.102★;
Chemistry 65.100;
Mathematics 69.104★, 69.105★, 69.114★;
Computer Science 95.107★;
1.0 arts or social science credit.

Second Year

Physics 75.222★, 75.264★;

Chemistry 65.211★, 65.212★;
Mathematics 69.204★, 69.375★;
Engineering 91.266★;
0.5 credit approved course in Chemistry, Physics, Mathematics and Statistics, Computer Science, or Engineering;
1.0 arts or social science credit.

Third Year

Physics 75.307★, 75.366★, 75.371★;
Chemistry 65.223★, 65.224★, 65.312★, 65.353★, 65.354★;
Mathematics 69.352★;
Electronics 97.315★;

Fourth Year

Chemistry 65.498 or Physics 75.499
Physics 75.477★;
1.0 credit in Physics at the 400-level;
Chemistry 65.315★, 65.412★;
0.5 credit in Chemistry at the 400-level;
1.0 credit free elective.

The Co-operative Education Option

General information on Co-op programs can be found on p. 39.

Co-operative education formally integrates the students' academic experience with work experience in industry and government. Work opportunities, which are available on a competitive basis, are coordinated to complement the student's course work and interests. Practical work experience provides insights and opportunities for development which help prepare an individual for a career in Chemistry.

Operation of the Co-operative Option

The stream is administered by the Co-operative Program Committee which is responsible for securing potential employers, arranging interviews, and generally managing the program. The details of the program are to be found in the Chemistry Co-op Student Handbook, which describes the entry requirements, the job, selection process, the conditions of employment, the requirements of the student during the work term including the Work Term Report and its evaluation.

Admission Requirements

Students are eligible to enter the Co-operative option in one of two ways:

- (i) directly from high school with a grade of 80 percent or better in OAC Chemistry and OAC grades sufficient to be accepted in Honours Chemistry
- (ii) after completion of 5.0 or more credits at Carleton University with a GPA of 8.0 or better in Chemistry and 6.5 overall. Students must be registered as full time in the Honours Chemistry program and be eligible to work in Canada.

The Work/Study Sequence

There are three four-month work terms. The timing of the employment terms is flexible. Examples include:

- (a) summer employment terms following Years 2, 3, and 4;
- (b) extended summer and fall employment terms following year 3 and summer employment following either year 2 or year 4.

If no suitable job placements can be made, the student will revert to the regular Honours program.

Continuation in the Program

Students must maintain a GPA of 8.0 or better in Chemistry and 6.5 or better overall. Students who do not meet this requirement

must revert of the regular Honours or Major Chemistry program.

During work terms, students must register in one of three Work Term Courses: 65.299★, 65.399★ or 65.499★. These courses will be graded Sat or Uns. To continue in the option, students must successfully complete their work terms, one of the requirements of which is to hand in a Work Term Report judged to be "Satisfactory". The report requirements and evaluation criteria are described in the Chemistry Co-op Student Handbook, which also lists all the circumstances in which students may be required to withdraw from the program. In addition, students must maintain the academic standards required for the Co-operative education option.

Graduation Requirements

In addition to satisfying the requirements of the Co-operative option as described above, a students must have completed the 20.0 credits specified for the Honours Chemistry program and three work term courses and meet all other University and Faculty regulations.

Graduates successfully completing the above requirements will receive a Co-operative degree designation in addition to the Honours designation.

Major Program

The total program (including First year) must contain:

1. Chemistry 65.100, 65.211★, 65.212★, 65.223★, 65.224★, 65.232★, 65.233★, and 2.0 credits at the 300-level including Chemistry 65.311★, 65.353★ and at least one of 65.315★, 65.325★, 65.335★, or 65.355★. (Note: Chemistry 65.355★ requires both Chemistry 65.353★ and 65.354★ as prerequisites or corequisites.)
2. Mathematics 69.107★, 69.117★, 69.207★ and an additional 0.5 mathematics credit at the 200-level;
3. Physics 75.101★ and 75.102★;
4. 0.5 Science Continuation credit not in Chemistry;
5. Computer Science 95.104★ or approved equivalent;
6. 1.0 First-year Science credit (as required in the First-year program);
7. 2.0 arts or social science credits (see Faculty of Science regulations);
8. 1.0 additional Science credit. Normally this will be chosen either from non-compulsory Chemistry courses or other science continuation courses;
9. 1.0 free credit.

Major in Computational Chemistry

First Year

Chemistry 65.100;
Computer Science 95.102★, 95.105★, 95.106★;
Mathematics 69.107★, 69.117★;
Biology 61.103★;
Physics 75.101★;
0.5 arts or social science credit.

Second Year

Chemistry 65.211★, 65.223★, 65.226★;
Computer Science 95.202★, 95.203★, 95.204★;
Mathematics 69.207★;
1.0 arts or social science credit;
0.5 Free elective credit.

Third Year

Chemistry 65.311★, 65.312★, 65.316★, 65.321★, 65.353★;
Computer Science 95.304★;
Biochemistry 63.310;
0.5 arts or social science credit;
0.5 Free elective credit.

Graduate Program

The Department of Chemistry offers studies leading to the degree of Master of Science and to the degree of Doctor of Philosophy. For further details consult the Graduate Studies and Research Calendar.

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Note: Under special circumstances, students not having the indicated prerequisites may register for courses by obtaining permission of the Department; this normally means permission of the instructor for that course.

Chemistry 65.010

Introductory Chemistry

Introduction to fundamental laws and principles of chemistry, and the techniques needed to solve numerical problems. Laboratory component introduces common lab methods and techniques, and reinforces some of the lecture material.

Precludes additional credit for OAC Chemistry.

Prerequisite: Ontario Grade 11 Chemistry or equivalent.

Lectures three hours a week, tutorial one hour a week.

Chemistry 65.100

General Chemistry

Solution equilibria, acid and base chemistry; electronic structure of atoms; energy states and spectra; descriptive chemistry and periodic properties of elements; structure of covalent and ionic substances; energy relationships and theories in bonding, equilibria, and rates of reactions. Experimental techniques in analysis and synthesis.

Precludes additional credit for Chemistry 65.111★.

Prerequisites: OAC in Calculus and Chemistry, or equivalent. This course is intended for students in all programs who plan to take further chemistry courses.

Lectures three hours a week, laboratory and tutorial three hours a week.

Chemistry 65.103★

The Chemistry of Food, Health and Drugs

Aspects of chemistry relating to food, food additives, drugs (both illicit and beneficial) and their relation to metabolism and health. Topics may include: proteins, carbohydrates, fats, vitamins and cofactors, enzymes, steroids, electrolyte and pH balance, trace elements.

Available only as a free option for Science students.

Prerequisite: A course in Chemistry (e.g. Ontario Grade 11).

Lectures three hours a week.

Chemistry 65.111★

Chemistry for Engineering Students

Topics include stoichiometry, atomic and molecular structure, thermodynamics and chemical equilibrium, acid-base chemistry, carbon dioxide in water, alkalinity, precipitation, electrochemistry, kinetics and basic organic chemistry. Laboratory component emphasizes techniques and methods of basic experimental chemistry.

Precludes additional credit for Chemistry 65.100.

Prerequisites: OAC in Calculus and Chemistry, or equivalent.

Lectures three hours a week, laboratory three hours a week.

Chemistry 65.211★

Physical Chemistry I

The principles of thermodynamics. Development of thermodynamic functions, enthalpy, entropy and free energy and their applications to biochemical and chemical processes. Brief introduction to EXCEL.

Precludes additional credit for Chemistry 65.210.

Students presenting both Chemistry 65.211 ★ and 65.227 ★ or 65.223 ★ will not be able to receive additional credit for 65.280 ★. Students in the B.Sc. program with Chemistry 65.223 ★ will only be able to use 65.280 ★ in the free elective category.

Prerequisites: Chemistry 65.100; Mathematics 69.107 ★ and 69.117 ★; OAC Physics or Physics 75.107 ★ and 75.108 ★.

Lectures three hours a week, problems one hour a week, laboratory three hours a week.

Chemistry 65.212 ★

Physical Chemistry II

Further development of thermodynamic equations and their applications to phase equilibria, chemical equilibria, electrochemistry, transport properties and kinetics.

Precludes additional credit for Chemistry 65.210.

Prerequisite: Chemistry 65.211 ★.

Lectures three hours a week, problems one hour a week, laboratory three hours a week.

Chemistry 65.223 ★

Organic Chemistry I

The structure, organization, and scope of organic chemistry including molecular structures of well-known and important organic chemicals, types of chemical reactions, and spectroscopic methods used in identification. Training in the handling and purification of organic compounds, organic chemical reactions, and the use of infrared spectroscopy.

Precludes additional credit for Chemistry 65.220 and 65.227 ★.

Students presenting both Chemistry 65.223 ★ and 65.211 ★ will not be able to receive additional credit for 65.280 ★. Students in the B.Sc. program with Chemistry 65.223 ★ will only be able to use 65.280 ★ in the free elective category.

Prerequisite: Chemistry 65.100.

Lectures three hours a week, laboratory three hours a week.

Chemistry 65.224 ★

Organic Chemistry II

Further discussion of chemical bonding in organic compounds, nomenclature, stereochemistry, and a systematic coverage of the chemical reactions of organic functional groups. Laboratory experience in organic chemical reactions, use of infrared spectroscopy and other techniques to determine the structure of unknown organic compounds.

Precludes additional credit for Chemistry 65.228 ★ or 65.226 ★.

Prerequisite: Chemistry 65.220 ★ or 65.223 ★.

Lectures three hours a week, laboratory three hours a week.

Chemistry 65.226 ★

Organic Chemistry IV

Further discussion of the chemical bonding in organic compounds, nomenclature, stereochemistry, and a systematic coverage of the chemical reactions of the organic functional groups. The laboratory consists of computational experiments and calculations on organic structures and reactions.

Precludes additional credit for Chemistry 65.220, 65.224 ★, or 65.228 ★.

Prerequisite: Chemistry 65.223 ★ or 65.227 ★.

Lectures three hours a week, laboratory three hours a week.

Chemistry 65.227 ★

Introduction to Organic Chemistry I

The structure, organization, and scope of organic chemistry, including molecular structures of well-known and important organic chemicals, types of chemical reactions, and spectroscopic methods used in identification.

Precludes additional credit for Chemistry 65.220 and 65.223 ★.

Students presenting both Chemistry 65.227 ★ and 65.211 ★ will not be able to receive additional credit for 65.280 ★. Students in the B.Sc. program with Chemistry 65.227 ★ will only be able to use 65.280 ★ in the free elective category.

Prerequisites: Chemistry 65.100.

Lectures three hours a week.

Chemistry 65.228 ★

Introduction to Organic Chemistry II

Further discussion of the chemical bonding in organic compounds, nomenclature, stereochemistry, and a systematic coverage of chemical reactions of the organic functional groups.

Precludes additional credit for Chemistry 65.220, 65.224 ★ or 65.226 ★.

Prerequisite: Chemistry 65.227 ★ or 65.223 ★.

Lectures three hours a week.

Chemistry 65.232 ★

Analytical Chemistry

The analytical measurement process. Sampling and sample preparation techniques. Instrumental methods of analysis including absorption spectrophotometry (UV-visible, IR), molecular fluorimetry, atomic spectrometry, inductively coupled plasma atomic emission and ion chromatography. Experimental methodologies for various organic, inorganic, geological and industrial analyses.

Precludes additional credit for Chemistry 65.230.

Prerequisites: Chemistry 65.100 or 65.111 ★, Mathematics 69.107 ★ and 69.117 ★.

Lectures three hours a week, laboratory three hours a week.

Chemistry 65.233 ★

Analytical Chemistry

Analytes in biological and environmental matrices are separated by solvent or solid phase extraction, before they are determined by chromatographic, mass spectrometric and electrochemical methods. Topics of social and economic interests will be covered, including drugs, food, lipids, proteins, pesticides, dioxins, and PCBs. Precludes additional credit for Chemistry 65.230 and 65.231 ★.

Prerequisites: Chemistry 65.100 or 65.111 ★, Mathematics 69.107 ★ and 69.117 ★.

Lectures three hours a week, laboratory three hours a week.

Chemistry 65.280 ★

Foundations for Environmental Chemistry

A basis of chemistry needed to understand the environment: composition of the atmosphere and natural waters; equilibrium; surface properties; kinetics and spectroscopy; physical and chemical properties of chemicals in the environment. This is a limited enrolment course; therefore top priority will be given to students registered in the Environmental Science program.

Students presenting both Chemistry 65.223 ★ and 65.211 ★ will not be able to receive additional credit for 65.280 ★. Students in the B.Sc. program with Chemistry 65.223 ★ will only be able to use 65.280 ★ in the free elective category.

Prerequisites: Chemistry 65.100, or 65.111 ★; and Mathematics 69.107 ★ or equivalents.

Lectures three hours a week, laboratory three hours a week.

Chemistry 65.299 ★

Co-operative Work Term Report 1

These work terms provide practical experience for students enrolled in the Co-operative option. To receive credit, students must receive satisfactory evaluations from their work term employer and in their written and oral reports. Graded *Sat* or *Uns*.

Prerequisites: Registration in the Chemistry Co-operative option and permission of the Department.

Chemistry 65.311 ★

Quantum Chemistry

Classical equations of motion, harmonic oscillator, diatomic and polyatomic molecules, molecular mechanics, quantum mechanics, Schrodinger equation and wave functions, vibrational spectra, hydrogen atom, quantum numbers, electronic spectra, bonding in small molecules.

Prerequisites: Chemistry 65.211 ★, Mathematics 69.207 ★.

Lectures and problems three hours a week.

Chemistry 65.312 ★

Methods of Computational Chemistry

Molecular orbital theory of organic and inorganic chemistry. Applications of computational chemistry to chemical bonding, aromaticity, molecular spectra. Semiempirical and ab initio electronic structure theory. Comparison of theoretical methods used to obtain molecular properties. Introduction to statistical thermodynamics.

Prerequisite: Chemistry 65.311 ★.

Lectures and problems three hours a week.

Chemistry 65.315 ★

Experimental Physical Chemistry

A laboratory-based course designed to acquaint students with advanced concepts in physical chemistry and the use of more advanced physico-chemical techniques in other areas of chemistry. Students are responsible for literature surveys, acquisition of theoretical background, design of experimental procedures and mathematical analysis of data.

Prerequisites: Chemistry 65.212 ★ and at least one of 65.223 ★, 65.232 ★, 65.233 ★, 65.311 ★ (may be taken concurrently).

Note: Withdrawal from Chemistry 65.311 ★ will require deregistration from Chemistry 65.315 ★.

Laboratory and seminars four hours a week.

Chemistry 65.316 ★

Computational Chemistry Methods Laboratory

Use of PC Spartan. Molecular mechanics models. Geometry optimization, vibration frequencies, IR spectra, animation of normal modes. Ab Initio and semiempirical models. Selection of an appropriate model; comparison of results. Reaction thermochemistry. Molecular structure. Transition states and activation energies. Display of graphical surfaces.

Prerequisite: Chemistry 65.311 ★.

Laboratory four hours a week.

Chemistry 65.321 ★

Advanced Organic Chemistry I

Instrumental methods for determining organic structures. Selected organic reactions with emphasis on mechanisms and reactive intermediates.

Prerequisite: Chemistry 65.224 ★ or 65.226 ★ or 65.228 ★.

Lectures three hours a week.

Chemistry 65.322 ★

Advanced Organic Chemistry II

Continued mechanistic survey of additional organic reactions with emphasis on synthetic usefulness and stereochemistry. Interspersed with selected topics such as instrumental methods, photochemistry, literature of organic chemistry, natural and synthetic polymers, heterocycles, terpenes and alkaloids.

Prerequisite: Chemistry 65.321 ★ or equivalent.

Lectures three hours a week.

Chemistry 65.325 ★

Experimental Organic Chemistry

A laboratory-based course including advanced concepts and techniques in organic synthesis, structure determination, and the rates and mechanisms of reactions. Students are responsible for literature surveys, acquisition of theoretical background, and design of experimental procedures.

Prerequisite: Chemistry 65.224 ★, 65.321 ★ or Biochemistry 63.310 (may be taken concurrently).

Note: Withdrawal from Chemistry 65.321 ★ will require deregistration from Chemistry 65.325 ★.

Laboratory four hours a week.

Chemistry 65.335 ★

Advanced Analytical Chemistry Laboratory

Advanced instrumentally based techniques of analysis. Emphasis on

identification and quantitation of low-level contaminants in environmental matrices using chromatographic and spectroscopic methods, including sampling, cleanup, measurement and reporting of results.

Prerequisites: Chemistry 65.232 ★ and 65.233 ★.

Laboratory four hours a week.

Chemistry 65.353 ★

Inorganic Chemistry I

The concepts of atomic theory, elemental properties and the periodic system, resonance, introduction to molecular orbital theory, main group chemistry, transition metal complexes, metalloproteins and solid state materials.

Prerequisite: Chemistry 65.100.

Lectures three hours a week.

Chemistry 65.354 ★

Inorganic Chemistry II

Symmetry and the application of group theory to spectroscopy and bonding, ligand field theory, solid state and molecular magnetic properties, organometallic chemistry, and electron transfer reactions.

Prerequisite: Chemistry 65.353 ★.

Lectures three hours a week.

Chemistry 65.355 ★

Experimental Inorganic and Analytical Chemistry

A laboratory-based course including advanced concepts and techniques in inorganic synthesis, structure determination and analytical chemistry. Students are responsible for literature surveys, acquisition of theoretical background, design of experimental procedures and mathematical analysis of data.

Prerequisites: Chemistry 65.211 ★, 65.232 ★, 65.233 ★, 65.353 ★ and 65.354 ★ (may be taken concurrently).

Note: Withdrawal from or a final grade of F in Chemistry 65.353 ★ will require deregistration from Chemistry 65.355 ★.

Laboratory four hours a week.

Chemistry 65.370 ★

Industrial Applications of Chemistry

Uses of chemistry in a number of industries: fertilizers, electrochemical, metallurgical, petrochemical, pulp and paper, plastics, pharmaceutical. Interaction of chemistry with economic, political, engineering, environmental, health, legal considerations. Guest lecturers.

Prerequisite: Chemistry 65.211 ★ and one of 65.227 ★ or 65.223 ★.

Chemistry 65.380 ★

The Chemistry of Environmental Pollutants

Inorganic and organic environmental pollutants: their toxicology, production, use pattern and known effects on the environment. Aspects of risk and regulation. Chemistry involved in water and sewage treatment.

Prerequisite: Chemistry 65.227 ★ or 65.223 ★ or 65.280 ★.

Lectures three hours a week.

Chemistry 65.399 ★

Co-operative Work Term Report 2

These work terms provide practical experience for students enrolled in the Co-operative option. To receive credit, students must receive satisfactory evaluations from their work term employer and in their written and oral reports. Graded *Sat* or *Uns*.

Prerequisites: Registration in the Chemistry Co-operative option and permission of the Department.

Chemistry 65.410 ★

Advanced Topics in Physical Chemistry I

Principles of Group Theory as applied to Chemistry. Point groups, character tables, symmetry orbitals, molecular orbitals, aromaticity, allowed and forbidden reactions, sandwich complexes. Selection rules in spectroscopy, molecular vibrations.

Prerequisites: Chemistry 65.312 ★ or Physics 75.362 ★.

Lectures three hours a week.

Chemistry 65.412★

Advanced Topics in Physical Chemistry II

Statistical thermodynamics, energy states, equilibrium, partition functions for diatomic molecules. Chemical kinetics: rate laws, solution of differential equations, transition state theory, bimolecular reactions in gases and in solution, chain reactions, catalysis, atmospheric chemical reactions and photochemistry.

Prerequisite: Chemistry 65.312★.

Lectures and seminars three hours a week.

Chemistry 65.422★

Advanced Topics in Organic Chemistry I

Topics include 2-dimensional ¹H and ¹³C NMR spectroscopy and structure determination of complex organic molecules. Also offered at the graduate level, with additional requirements, as Chemistry 65.547★, for which additional credit is precluded.

Prerequisite: Chemistry 65.321★.

Lectures and seminars three hours a week.

Chemistry 65.423★

Advanced Topics in Organic Chemistry II

Synthetic organic chemistry. The application of reactions to the synthesis of organic molecules. Emphasis on design of sequences, new reagents, and stereoselectivity.

Prerequisites: Chemistry 65.321★ and 65.322★.

Lectures and seminars three hours a week.

Chemistry 65.424★

Organic Polymer Chemistry

Introduction to basic principles of polymer chemistry, industrial and synthetic polymers, different types of polymerization and polymer characterization. Study of commodity plastics, engineering thermoplastics, and specialty polymers, with emphasis on their synthesis. Also offered at the graduate level, with additional or different requirements, as Chemistry 65.546, for which additional credit is precluded.

Prerequisites: Chemistry 65.321★ or equivalent.

Lectures three hours a week.

Chemistry 65.431★

Advanced Topics in Analytical Chemistry I

Trace and ultratrace analytical chemistry. Sampling and sample preservation. The problems of the blank. Trace and ultratrace analysis. Sampling and sample preparation. Atomic absorption, fluorescence and emission spectroscopy.

Prerequisites: Chemistry 65.211★; 65.232★ or 65.233★.

Given in alternate years with Chemistry 65.432★.

Chemistry 65.432★

Advanced Topics in Analytical Chemistry II

Solutions and separations in analytical chemistry. Stability of aqueous solutions of standards and samples. Complex formation, multi-step and competing equilibria and their application to the design of selective methods of separation and determination. Electroanalytical techniques. Electroanalytical chemistry of aqueous solutions. Phase equilibria and solvent extraction.

Prerequisites: Chemistry 65.211★; 65.232, or 65.233★.

Text: Laitinen and Harris, Chemical Analysis, Second Edition.

Given in alternate years with Chemistry 65.431★.

Lectures and seminars three hours a week.

Chemistry 65.446★

Pharmaceutical Drug Design

Important elements of rational drug design. Ligand-receptor interactions, structure-activity relationships, molecular modeling of pharmacophores, structure and mechanism-based approaches to drug design. Enzyme inhibition in chemotherapy and design of anti-viral drugs.

Prerequisite: Chemistry 65.211★, 65.223★ or 65.227★ and Biochemistry 63.310.

Lectures and laboratory five hours a week.

Chemistry 65.452★

Radiochemistry

A study of nuclear stability and decay; chemical studies of nuclear phenomena. Applications of radioactivity.

Prerequisites: Chemistry 65.212★, 65.232★ and 65.233★; or permission of the Department.

Reference text: Friedlander, Kennedy, Macias and Miller, Nuclear and Radiochemistry.

Lectures and seminars three hours a week.

Chemistry 65.453★

Advanced Topics in Inorganic Chemistry I

Static and dynamic structures of inorganic coordination compounds. Group-theoretical description of vibrational and electronic excited states. Ligand-field, parameters, bond covalence, prediction of inorganic reaction paths.

Precludes additional credit for Chemistry 65.450★.

Prerequisite: Chemistry 65.354★ or equivalent.

Lectures three hours a week.

Chemistry 65.454★

Advanced Topics in Inorganic Chemistry II

Reactivity of inorganic coordination compounds. Thermodynamic and kinetic factors affecting reactivity. Industrial and biochemical processes catalyzed by metal coordination compounds. Experimental methodologies, data analysis and rate law evaluation used to obtain reaction mechanisms leading to improved methods of catalysis.

Prerequisite: Chemistry 65.354★ or equivalent.

Lectures three hours a week.

Chemistry 65.470★

Special Topics in Chemistry

A topic of current interest in any branch of chemistry. Only one special topics course may be presented for credit.

Prerequisite: Permission of the Department.

Chemistry 65.480★

Atmospheric Chemistry

Properties of natural atmospheric constituents; biogeochemical cycles involving gases; chemical reactions in the atmosphere; anthropogenic atmospheric pollutants (e.g., chlorofluorocarbons, sulphur and nitrogen oxides, photochemical smog sources and effects on the biosphere. Relation between the structure of molecules and their spectral and reactive properties.

Prerequisite: Chemistry 65.211★ or 65.280★.

Lectures three hours a week.

Chemistry 65.498

Research Project and Seminar

Senior students in Honours Chemistry carry out a research project under the direction of one of the members of the Department. A written report and an oral presentation of the work are required before a grade can be assigned.

Prerequisites: Any two of 65.315★, 65.325★, 65.335★ and 65.355★.

Laboratory and associated work equivalent to at least eight hours a week for two terms.

Chemistry 65.499★

Co-operative Work Term Report 3

These work terms provide practical experience for students enrolled in the Co-operative option. To receive credit, students must receive satisfactory evaluations from their work term employer and in their written and oral reports. Graded *Sat* or *Uns*.

Prerequisites: Registration in the Chemistry Co-operative option and permission of the Department.

Child Studies (Arts and Social Sciences)

2216 Dunton Tower
Telephone: 520-2368

Academic Administration

Program Co-ordinator, Tina Daniels

Members of the Committee, Robert Coplan, Ann Croll, Charles Gordon, Karen March, Dominique Marshall, Shelley Parlow

General Information

The interdisciplinary program in Child Studies was developed to meet the need for advanced study in the field of early childhood education (ECE). The program leads to both B.A. and B.A. (Honours) degrees. Articulation agreements with Algonquin College of Applied Arts and Technology in Ottawa and Loyalist College in Belleville allow graduates with the ECE diploma from these colleges to apply for admission into the program. Successful applicants will be granted up to a maximum of 5.0 credits on admission. Applicants from other colleges are welcome and will be considered on an individual basis.

Students enter the program in one of two ways. Admission to Category A (Sequential) requires a completed ECE diploma from a CAAT two-year Early Childhood Education program (or equivalent). Students can graduate with a B.A. degree after two years of full-time study, or a B.A. (Honours) degree after three years.

Applicants who do not have the ECE diploma and who wish to be considered for Category B (Concurrent) should make an application to the Extended ECE diploma program at Algonquin College and will also be expected to register as a Special Student at Carleton University through the School of Continuing Education. A separate application for admission into the Child Studies program at Carleton must be made by June 1 of the third year of study.

It is expected that eligible students will graduate with the ECE diploma from Algonquin College after three years of study, and either a B.A. degree from Carleton with one additional year of study, or a B.A. (Honours) degree with two additional years of study.

This program is designed to enable students to develop an interdisciplinary perspective on early childhood. To this end, it introduces students to a range of social, psychological, cultural, ethical and other factors affecting young children and their families in a Canadian context, as well as to the empirical methods and techniques used to study early childhood. Honours students will be offered the opportunity to study a particular area of interest (e.g., Developmental, Sociocultural, Managerial). The program as administered by the Institute of Interdisciplinary Studies (see p. 300 for the Institute's general listing).

Admission Requirements

Enrolment into the program is limited. Successful applicants must demonstrate a high level of personal enthusiasm and professionalism, excellent communication skills (oral and written) and evidence of previous academic success. Further information may be obtained from the Program Co-ordinator to whom applications for admission in *Category A (Sequential)* should be made, presenting:

(a) the diploma in Early Childhood Education from Algonquin or Loyalist College or an equivalent Early Childhood Education program from another institution;

(b) a B+ average overall or better at the college level;

(c) satisfactory performance in field placements;

(d) three letters of reference, including at least one letter from a faculty member in the ECE program, and one letter from the director of a child care centre;

(e) a letter of application, including a statement of professional goals and expectations of the program and a curriculum vitae.

(Category B applicants)

Category B (Concurrent) applicants must meet admission requirements and regulations for both Algonquin College and Carleton University. Separate applications must be made to enroll in the extended ECE program at Algonquin College and also to the School of Continuing Education at Carleton for registration as a Special student. Students should consult with the Program Co-ordinator before registering for courses at Carleton. After three years of study, candidates may apply to the Program Coordinator for admission into the Child Studies program under Category B (Concurrent), presenting:

(a) the diploma in Early Childhood Education from Algonquin College;

(b) a B+ average overall or better at the college level;

(c) satisfactory performance in field placements;

(d) three letters of reference, including at least one letter from a faculty member in your ECE program, and one letter from the director of a child care centre;

(e) a letter of application, including a statement of professional goals and expectations of the program, and a curriculum vitae;

(f) an overall average in their Carleton courses sufficient to meet the comparable standing requirements for continuation in the B.A. Programs (see sections 5.7 and 5.8, p. 72).

Upon admission into the program, students in both categories will be granted up to a maximum of 5.0 credits based on their ECE studies and related work experience, on the recommendation of the Program Coordinator. These credits are applicable only to the Child Studies program.

Students admitted under *Category A* may receive the following:

Child Studies 04.14x★, 04.24x★, Interdisciplinary Studies 03.14x★, 03.24x★, Psychology 49.25x★, 49.35x★, 49.391★, Social Work 52.221★, Sociology 53.1xx★, 53.2xx★

Students admitted under *Category B* may receive the following:

Child Studies 04.14x★, 04.24x★, 04.39x, Interdisciplinary Studies 03.14x★, 03.24x★, Psychology 49.391★, Social Work 52.221★, Sociology 53.1xx★, 53.2xx★.

Graduation Regulations

In order to graduate, students must fulfill all University graduation Requirements (see p. 48) and all Faculty requirements (see p. 74), in addition to all the Major requirements set out below.

B.A.(Honours) Program

For the B.A.(Honours) degree, candidates for the Child Studies program must meet the normal requirements of 20.0 credits. These will include a core of 10.0 credits plus 5.0 program elective credits. Students who have obtained the ECE diploma with a B+ average or better will be granted up to a maximum of 5.0 credits on admission.

Course Requirements:

1. 2.5 credits in Interdisciplinary Studies:
 - 03.410 ★, 04.251 ★, 04.391 ★, 04.498
2. 2.5 credits in Psychology:
 - 49.101 ★ and 49.102 ★ (or 49.100), 49.250 ★
 - Two of: 49.355 ★, 49.356 ★, 49.357 ★
3. 2.0 credits in Sociology or a related discipline:
 - One of: 56.220, 56.235, 54.230, 12.100, 24.130
 - 53.315
4. 1.0 credit in research methods:
 - One of: 49.200, 53.203
5. 1.0 credit in the Faculty of Science and/or the School of Computer Science.
6. 1.0 credit in the Faculty of Arts and Social Sciences and/or the Faculty of Public Affairs and Management, not Psychology or Sociology.
7. 5.0 elective credits proposed by the student and approved by the Program Co-ordinator.

These must include a minimum of 1.0 credit at the 300- or 400-level. Some students may have to take courses extra to the degree to meet prerequisite requirements.

8. Any additional credits required to meet the total specified in the Statement of Standing on Admission, as proposed by the student and approved by the Program Co-ordinator.

A list of program electives that may be of interest can be obtained from the Program Co-ordinator.

In collaboration with the Program Co-ordinator, Honours students will develop a field of interest. Normally, a minimum of 2.0 elective credits should be in the field of interest. Three possible fields of interest are Developmental, Sociocultural and Managerial. A list of courses related to these fields can be obtained from the Program Co-ordinator.

Honours students who plan to apply for admission to Teacher's College or a graduate program should seek advice from the Program Co-ordinator in selecting their elective credits. Some substitutions to required courses may be acceptable, with permission of the Program Co-ordinator and the relevant department.

If a student admitted into either the B.A. or B.A. (Honours) program changes to another program after entry, transfer credits will be reassessed by the new program. This may result in a reduction of credits.

B.A. Program

For the B.A. degree, candidates for the Child Studies program must meet the normal requirements of 15.0 credits. These will include a core of 8.5 credits plus 1.5 program elective credits. Students who have obtained the ECE diploma with a B+ average or better will be granted up to a maximum of 5.0 credits on admission.

In collaboration with the Program Co-ordinator, students will design individual programs with a clear theme. This program should be complementary to their previous studies in early childhood education.

The requirements are the same as those for the B.A. (Honours) degree except:

1. 1.0 credit in Interdisciplinary Studies:
 - 04.251 ★, 04.391 ★
7. 1.5 elective credits proposed by the student and approved by the Program Coordinator. Some students may have to take courses extra to the degree to meet prerequisite requirements.

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Child Studies 04.251 ★

Issues in Child Studies

This course takes an interdisciplinary approach to Child Studies, introducing students to the perspectives and methods of study employed by various disciplines, including psychology and sociology. Issues related to research ethics will be introduced. Prerequisite: Psychology 49.101 ★ and 49.102 ★ or 49.100 and permission of the Institute.

Lecture and discussion groups, three hours a week.

Interdisciplinary 04.391 ★

Themes in Interdisciplinary Inquiry

The course will examine topics chosen by the interdisciplinary faculty, along with various methods of inquiry and styles of thought that may be brought to bear upon them. Student reading and research will compare, contrast and synthesize various perspectives. Prerequisite: Third-year standing in Child Studies, or permission of the Institute.

Seminar three hours a week.

Social Sciences 03.410

Seminar on Special Research Problems in Social Sciences

This is a research-oriented Honours seminar that focuses on special problems in the Social Sciences.

Prerequisite: Fourth-year Honours in a social sciences discipline or permission of the program co-ordinator.

Interdisciplinary 04.498

Honours Project

Interdisciplinary research project for Honours students in the Fourth year of all IIS programs, except Cognitive Science. In selecting a project, students must consult their Program Coordinator. Only the Program Coordinator can assign a supervisor or grant approval to register in this course. Faculty regulations governing Honours Research Essays and Honours Theses apply (see p. 67).

Registration in this course is limited to students in the Fourth year of a B.A. (Honours) program in IIS.

Civil and Environmental Engineering (Engineering)

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Telephone: 520-5784
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Academic Administration

Chair, J.L. Humar

Teaching Staff

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Professors

G.E. Bauer, B.A.Sc. (Toronto), M.A.Sc. (Waterloo), Ph.D. (Ottawa), F.E.I.C., P.Eng. • **John P. Braaksma**, B.A.Sc., M.A.Sc., Ph.D. (Waterloo), P.Eng. • **A.O. Abd El Halim**, B.Sc. (Alexandria), M.A.Sc. (Toronto), Ph.D. (Waterloo), P.Eng. • **Gilbert A. Hartley**, B.Eng., M.Eng. (Carleton), Ph.D. (Waterloo), P.Eng. • **Jagmohan Lal Humar**, B.Sc. (Banaras Hindu), M.Tech. (Indian Institute of Technology), Ph.D. (Carleton), F.C.S.C.E., F.E.I.C., P.Eng. • **Deniz Karman**, B.Sc. (Middle East Technical University, Turkey), M.Sc. (Ege Universitesi), Ph.D. (New Brunswick) • **Ata M. Khan**, B.Eng., M.Eng. (American University of Beirut), Ph.D. (Waterloo), P.Eng. • **K.T. Law**, B.Sc., M.Sc. (Hong Kong), Ph.D. (Western Ontario), P.Eng. • **A.G. Razaqpur**, B.Sc. (American University, Beirut), M.Sc. (Hawaii), Ph.D. (Calgary), P.Eng. • **Juan Jose Salinas-Pacheco**, Ingeniero Civil (Instituto Tecnológico y de Estudios Superiores de Monterrey), M.Sc. (Illinois), Ph.D. (Calgary), P.Eng. • **Sampat Sridhar**, B.Tech., M.Tech. (IIT, Madras), Ph.D. (New Brunswick), P.Eng. • **G.T. Suter**, B.Eng.Sc. (Western Ontario), M.A.Sc., Ph.D. (Toronto), P.Eng.

Associate Professors

Neal M. Holtz, B.Sc. (Alberta), M.Eng. (Technical University of Nova Scotia), Ph.D. (Carnegie-Mellon) • **Stephen J. Kennedy**, B.A.Sc. (Windsor), M.Sc., Ph.D. (Alberta) • **David T. Lau**, B.Eng. (McMaster), M.S., Ph.D. (California at Berkeley), P.Eng. • **Wayne J. Parker**, B.A.Sc., M.A.Sc., Ph.D. (Waterloo), P.Eng.

Assistant Professor

Paul Van Geel, B.A.Sc., Ph.D. (Waterloo)

Lecturer

Pascale Champagne, B.Sc. (McGill), B.Eng. (Guelph), M.Eng. (Carleton)

Adjunct Research Professors

D. Bell, Transport Canada • **M.S. Cheung**, Public Works • **S.E. Chidiac**, National Research Council Canada • **S.M. Easa**, Lakehead University • **G.Y. Felio**, National Research Council Canada • **K. Ibrahim**, Public Works • **W.F. Johnson**, Transport Canada • **J. Mehaffey**, Forintek Canada Corp. • **E. H. H. Mohamed** • **B. Persaud**, Ryerson Polytechnic University • **A.P.S. Selvadurai**, McGill University • **L. Shallal** • **O.J. Svec**, National Research Council Canada • **M. Warith** • **E.W. Wright**, E.W. Wright & Associates

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

As a result of the transition from the old program to the new program there may be some duplication of course descriptions and alterations in the course numbering.

Engineering 82.104 ★

Surveying

Surveying principles and practice. Measurements of distance, elevation differences, and angles. Errors and corrections. Theory, use and adjustments of surveying equipment. Note keeping. Procedures, triangulation, leveling, topographic and legal surveys. Road and building layout, horizontal and vertical curves, earth-work. Planning and application to Civil Engineering works. Lectures and field work three weeks at the beginning of the Spring term.

Engineering 82.105 ★

Introduction to Technology

Technical issues involved in architectural design of buildings from ancient times to the present. Technological innovation and materi-

als related to structural developments, and the organization and design of structures. Basic concepts of equilibrium, and mechanics of materials.

Precludes additional credit for Architecture 72.213 ★.

Lectures three hours a week, laboratory three hours a week.

Engineering 82.211 ★

Mechanics II

Plane trusses. Virtual work. Friction. Relative motion of particles. Kinematics of a rigid body: translation, rotation; general plane motion; absolute and relative motion. Kinetics of a rigid body: equations of motion; work-energy; impulse-momentum; conservation of momentum and energy. Conservative forces and potential energy.

Precludes additional credit for Engineering 86.211 ★ and 91.211 ★. Prerequisites: Engineering 91.111 ★ and Mathematics 69.104 ★ and 69.114 ★.

Lectures three hours a week, problem analysis three hours a week.

Engineering 82.220 ★

Mechanics of Deformable Bodies

Stress and strain. Stress-strain relationship: Hooke's law. Torsion of circular shafts. Bending moment and shear force distribution. Flexural stresses. Deflection. Shear stress in beams. Stresses in thin-

walled cylinders. Transformation of 2D stress and strain: Mohr's circle. Buckling of columns.

Precludes additional credit for Engineering 86.222 ★.

Prerequisite: Engineering 91.111 ★.

Lectures three hours a week, problem analysis and laboratory three hours a week.

Engineering 82.270 ★

Civil Engineering Materials

Introduction to material science. Structure of atoms. Crystallography. Crystal Imperfections. Characteristics, behaviour and use of Civil Engineering materials: Steel, Concrete, Asphalt, Wood, Polymers, Composites. Specifications. Physical, chemical and mechanical properties. Quality control and material tests. Fatigue. Corrosion. Applications in construction and rehabilitation of structures.

Prerequisites: Chemistry 65.111 ★, Mathematics 69.104 ★, and Physics 75.104 ★.

Lectures three hours a week, problem analysis and laboratories three hours a week.

Engineering 82.322 ★

Advanced Mechanics

Shear flow. Definition of shear centre, Saint Venant and warping torsional constants. Behaviour, governing differential equations and solutions for torsion, beam-columns, lateral torsional buckling of doubly symmetric beams, axially loaded doubly symmetric, singly symmetric and asymmetric columns. Failure criterion, fatigue and fracture.

Precludes additional credit for Engineering 82.444 ★ and 86.322 ★.

Prerequisite: Engineering 82.220 ★.

Lectures three hours a week, problem analysis three hours alternate weeks.

Engineering 82.323 ★

Introduction to Structural Analysis

Concepts and assumptions for structural analysis: framed structures; joints; supports; compatibility and equilibrium; stability and determinacy; generalized forces and displacements. Principle of Virtual Work: unknown force calculations; influence lines. Complementary Virtual Work: displacement calculations; indeterminate analysis. Introduction to the Stiffness Method of Analysis.

Prerequisite: Engineering 82.220 ★.

Lectures three hours a week, problem analysis three hours alternate weeks.

Engineering 82.324 ★

Introduction to Structural Design

Building systems and bridge types. Limit States Design. The design process. Material standards. National Building Code of Canada. The determination of dead, live, snow, rain, wind, earthquake and crane loads. Preliminary analyses. The determination of maximum load effects.

Lectures three hours a week, laboratory and problem analysis three hours alternate weeks.

Engineering 82.325 ★

Design of Structural Steel Components

Introduction to CAN/CSA - S16.1, design and behaviour concepts; shear lag, block shear, local plate buckling, lateral torsional buckling, instantaneous centre, inelastic strength and stability. Design of tension members, axially loaded columns, beams, beam-columns, simple bolted and welded connections. (Also listed as Architecture 77.316 ★.)

Prerequisites: Engineering 82.220 ★ and 82.324 ★.

Lectures three hours a week, problem analysis three hours alternate weeks.

Engineering 82.326 ★

Design of Reinforced Concrete Components

Introduction to CAN/CSA - A23.3; design and behaviour concepts; shear, bond, Whitney stress block, under and over reinforced

behaviour, strain compatibility and ultimate strength, construction detailing. Flexural design of singly reinforced, doubly reinforced and T-beams. Shear design for beams. Design of slabs, columns, and footings.

Prerequisites: Engineering 82.220 ★ and 82.324 ★.

Lectures three hours a week, problem analysis three hours alternate weeks.

Engineering 82.328 ★

Geotechnical Mechanics

Soil composition and soil classification. Soil properties, compaction, seepage and permeability. Concepts of pore water pressure, capillary pressure and hydraulic head. Principle of effective stress, stress-deformation and strength characteristics of soils, consolidation, stress distribution with soils, and settlement. Laboratory testing. (Also listed as Geography 45.417 ★ and Geology 67.417 ★.)

Prerequisites: Geology 67.244 ★ or equivalent and Third-year registration, or permission of the Department.

Lectures three hours a week, laboratory three hours alternate weeks.

Engineering 82.334 ★

Transportation Engineering and Planning

Transportation and the socio-economic environment; modal and intermodal systems and components; vehicle motion, human factors, system and facility design; traffic flow; capacity analysis; planning methodology; environmental impacts; evaluation methods. (Also listed as Geography 45.434 ★.)

Prerequisite: Third-year registration, or permission of the Department.

Lectures three hours a week, problem analysis three hours alternate weeks.

Engineering 82.420 ★

Matrix Analysis of Framed Structures

Review of basic structural concepts. Betti's law and applications. Matrix flexibility method; flexibility influence coefficients. Development of stiffness influence coefficients. Stiffness method of analysis: beams; plane trusses and frames; space trusses and frames. Introduction to the finite element method. (Also listed as Architecture 77.314 ★.)

Prerequisite: Engineering 82.323 ★.

Lectures three hours a week, problem analysis three hours alternate weeks.

Engineering 82.421 ★

Finite Element Methods in Structural Analysis

Review of matrix stiffness analysis of frames. Introduction to theory of elasticity. Simple finite elements. Virtual Work formulation of equilibrium of structure and element. Lagrange interpolation and basis for displacement shape functions. Considerations in finite element modelling. Plate bending theory and analysis. Also offered, at the graduate level with additional or different requirements, as Engineering 82.513 for which additional credit is precluded.

Prerequisite: Engineering 82.420 ★.

Lectures three hours a week, problem analysis three hours alternate weeks.

Engineering 82.422 ★

Wood Engineering

Structural design in timber. Properties, anatomy of wood, wood products, factors affecting strength and behaviour, strength evaluation and testing. Design of columns, beams and beam-columns. Design of trusses, frames, glulam structures, plywood components, formwork, foundations, connections and connectors. Inspection, maintenance and repair. (Also listed as Architecture 77.422 ★.)

Prerequisite: Fourth-year registration or permission of the Department.

Lectures three hours a week, problem analysis three hours alternate weeks.

Engineering 82.428 ★**Geotechnical Engineering**

Strength of soils; shear strength, bearing capacity, consolidation. Stress distribution in soils. Earth pressures; at rest, active and passive. Design of flexible and rigid retaining structures. Stability of excavations, slopes and embankments. Settlement of foundations. Bearing capacity of footings.

Prerequisite: Engineering 82.328 ★.

Lectures three hours a week, problem analysis three hours alternate weeks.

Engineering 82.429 ★**Highway Engineering**

Highway planning; highway location and geometric design; traffic engineering; highway capacity; soil classifications; subgrade and base materials; highway drainage; frost action; structural design of rigid and flexible pavements; highway economics and finance; maintenance and rehabilitation.

Lectures three hours a week, problem analysis three hours alternate weeks.

Engineering 82.431 ★**Foundation Engineering**

A critical study of the theories in soil mechanics and their application to the solution of geotechnical engineering problems. Field investigations, laboratory and field testing, special footings, mat foundations, caissons, pile foundations and excavations. Discussion of new methods and current research.

Prerequisite: Engineering 82.428 ★.

Lectures three hours a week, laboratory three hours alternate weeks.

Engineering 82.432 ★**Reinforced and Prestressed Concrete Design**

Reinforced concrete shear and torsion design by the General Method. Two-way slab design by Direct Design and Equivalent Frame Method. Behaviour and design of slender reinforced concrete columns. Prestressed concrete concepts; flexural analysis and design; shear design; anchorage zone design; deflection and prestress loss determination.

Prerequisite: Engineering 82.326 ★.

Lectures three hours a week, problem analysis three hours alternate weeks.

Engineering 82.433 ★**Urban Planning**

A systematic approach to urban planning; urban sprawl; data collection; forecasting; standards; space requirements; land use; zoning; transportation; land development; site selection; land capability; layout; evaluation; housing; urban renewal and new towns. (Also listed as Geography 45.433 ★.)

Prerequisite: Third-year registration, or permission of the Department.

Lectures three hours a week, problem analysis three hours alternate weeks.

Engineering 82.437 ★**Municipal Hydraulics**

Hydraulics of sewers flowing partially full, flow in sewer junctions and transitions; estimates of amounts of sanitary and storm sewage; design of sewage collection systems; pumps, control, and measuring devices. Open channel flow and hydraulics of treatment processes.

Prerequisite: Engineering 86.230 ★.

Lectures three hours a week, problem analysis three hours alternate weeks.

Engineering 82.438 ★**Behaviour and Design of Steel Structures**

Behaviour and design of open web steel joists, steel and composite decks, composite beams and columns, stud girders, and plate

girders. Design of moment connections, base plates and anchor bolts, and bracing connections. Stability of rigid and braced frames. Design for lateral load effects.

Prerequisites: Engineering 82.325 ★ and Fourth-year registration. Lectures three hours a week, problem analysis three hours alternate weeks.

Engineering 82.440 ★**Construction/Project Management**

Systems approach to project planning and control. Analysis of alternative network planning methods: CPM, precedence and PERT; planning procedure; computer techniques and estimating; physical, economic and financial feasibility; implementation feedback and control; case studies. (Also listed as Business 42.438 ★.)

Prerequisite: Fourth-year registration.

Lectures three hours a week, problem analysis three hours alternate weeks.

Engineering 82.443 ★**Masonry Design**

Introduction to structural design in masonry. Properties of masonry materials and assemblages. Behaviour and design of beams, walls and columns. Selected topics including veneer wall systems, differential movement, workmanship, specifications, inspection, maintenance and repair. Lowrise and highrise building design. Also offered, at the graduate level with additional or different requirements, as Engineering 82.520, for which additional credit is precluded.

Prerequisite: Fourth-year registration or permission of the Department.

Lectures three hours a week, problem analysis three hours alternate weeks.

Engineering 82.447 ★**Municipal Engineering**

Introduction to fundamentals of municipal engineering. City management; permits and approvals; water supply, treatment and distribution; sewage collection, treatment and disposal; solid waste management; snow disposal; protective services.

Precludes additional credit for Engineering 82.337 ★.

Prerequisite: Fourth-year registration.

Lectures three hours a week, problem analysis three hours alternate weeks.

Engineering 82.450 ★**Computer Methods in Civil Engineering**

Application of object oriented programming to solve Civil Engineering problems in surveying; transportation, hydrotechnical, geotechnical, environmental and structural engineering. Computing techniques include data structures, data storage and data base management, development of hypertext documents, and the development of graphical user interfaces.

Prerequisites: Engineering 94.266 ★ and Fourth-year registration.

Lectures three hours a week, problem analysis three hours alternate weeks.

Engineering 82.460 ★**Advanced Building Systems**

Architecture as a multi-disciplinary endeavour with emphasis on the architect's role and responsibility. Relationship of design intentions to support, enclosure, services, interior finishes with emphasis on contemporary concerns and means in architecture. Basic concepts of structural analysis and design.

Precludes additional credit for Architecture 77.313 ★.

Prerequisites: Architecture 77.101 ★ and Engineering 82.105 ★.

Lectures three hours a week, laboratory one hour a week.

Engineering 82.495 ★**Professional Practice**

Presentations by faculty and external lecturers on the Professional Engineers Act, professional ethics and responsibilities practice within

the discipline and its relationship with other disciplines and to society, health and safety, environmental stewardship, principles and practice of sustainable development. Communication skills are emphasized.

Precludes additional credit for Engineering 86.495 ★, 94.395 ★ and 97.395 ★

Prerequisite: Fourth-year registration.
Lectures three hours a week.

Engineering 82.497

Engineering Project

A major project in engineering analysis, design, development or research carried out by individual students or small teams. The objective is to provide an opportunity to develop initiative, self-reliance, creative ability and engineering judgement. A project proposal, an interim report, an oral presentation, and a comprehensive final report are required.

Engineering 81.201 ★

Process Analysis for Environmental Engineering

Material and energy balances for reacting and non-reacting systems. Applications in mining, metallurgy, pulp and paper, power generation, energy utilization. Emissions to the environment per unit product or service generated. Introduction to life cycle analysis, comparative products and processes.

Prerequisites: Chemistry 65.111 ★ or equivalent, and Engineering 86.240 ★, or approval of the Department.
Lectures two hours a week, problem analysis three hours a week.

Engineering 81.202 ★

Microbiology

The biology of the Bacteria, Archaea, Viruses and Protozoans, from the fundamentals of cell chemistry, molecular biology, structure and function, to their involvement in ecological and industrial processes and human disease. (Also listed as Biology 61.233 ★.)

Precludes additional credit for Biology 61.331 ★
Prerequisite: Biology 61.103 ★ or Chemistry 65.111 ★.
Lectures three hours a week.

Engineering 81.301 ★

Environmental Engineering Unit Operations

Dimensional analysis and dimensionless numbers; Agitation and mixing of fluids; Flow past particles, drag coefficients, settling classification; Filtration and other mechanical separations; Heat transfer, individual and overall coefficients; Mass transfer, individual and overall coefficients; Absorption and leaching; Membrane separations. Laboratory procedures: Settling operations, filtration, aeration.

Prerequisite: Engineering 86.230 ★.
Lectures three hours a week, problem analysis one hour a week, laboratory three hours alternate weeks.

Engineering 81.302 ★

Environmental Engineering Systems Modelling

Engineered systems for pollution abatement; Chemical reaction engineering; reaction kinetics and rate data analysis; design and modelling of reactors; single and multiple reactions; ideal and nonideal reactors; single and multi-parameter models; biochemical reaction engineering; process control. Laboratory procedures: reactor systems performance: Batch, CSTR and PFR.

Prerequisites: Chemistry 65.111 ★, Mathematics 69.204 ★, Engineering 81.201 ★.

Lectures three hours a week, problem analysis one hour a week, laboratory three hours alternate weeks.

Engineering 81.303 ★

Water Resources Engineering

A quantitative analysis of natural water systems and the development of these systems, as a resource, by society. Distribution of water resources in Canada, descriptive and quantitative hydrology, groundwater, probability concepts in water resources, optimization

of water resource utilization, water distribution and pipe networks. (Also listed as Geography 45.413 ★.)

Prerequisites: Engineering 82.328 ★ and 86.230 ★, or permission of the Department.

Lectures three hours a week, problem analysis one hour a week.

Engineering 81.304 ★

Contaminant and Pollutant Transport in the Environment

Physical phenomenon governing the transport of contaminants in the environment: diffusion, advection, dispersion, sorption, interphase transfer. Derivation and application of transport equations in air, surface and groundwater pollution; analytical and numerical solutions. Equilibrium partitioning of contaminants among air, water, sediment, and biota.

Prerequisites: Chemistry 65.280 ★, Engineering 81.302 ★.

Lectures three hours a week, problem analysis one hour a week.

Engineering 81.402 ★

Environmental Geotechnical Engineering

Landfill design; hydrogeologic principles, water budget, landfill liners, geosynthetics, landfill covers, quality control/quality assurance, clay leachate interaction, composite liner design and leak detection. Landfill operation, maintenance and monitoring. Case studies of landfill design and performance. Geotechnical design of environmental control and containment systems.

Prerequisites: Engineering 81.304 ★, 82.328 ★.

Lectures three hours a week, problem analysis one hour a week.

Engineering 81.403 ★

Air Pollution and Emissions Control

Sources and classification of air pollutants. Ambient air quality objectives and monitoring. Stoichiometric, thermodynamic, kinetic considerations in combustion. Particulates. Control and measurement of emissions from mobile and stationary sources. Indoor air quality. Laboratory procedures: emissions from boilers and IC engines, particulate size distribution and control.

Prerequisites: Chemistry 65.280 ★, Engineering 86.230 ★, 86.240 ★.
Lectures three hours a week, problem analysis one hour a week, laboratory three hours alternate weeks.

Engineering 81.405 ★

Environmental Engineering Unit Processes

Chemical treatment methods, biological waste water treatment, and sludge management. Removal of trace organics/hazardous substances. Nutrient removal. Laboratory procedures: Activated sludge, anaerobic growth, chemical precipitation, chlorination.

Prerequisites: Engineering 81.202 ★, 81.301 ★, 81.302 ★.

Lectures three hours a week, problem analysis one hour a week, laboratory three hours alternate weeks.

Engineering 81.406 ★

Hydrogeology and Groundwater Flow

Theory of flow through porous media; soil characterization, soil properties, anisotropy, heterogeneity. Contaminant transport. Unsaturated and multiphase flow. Flow in fractured media. Numerical modelling: finite differences, finite elements, boundary conditions. Site remediation and remediation technologies. Case studies and parameter sensitivity.

Prerequisites: Engineering 81.304 ★ and 82.328 ★.

Lectures three hours a week, problem analysis three hours alternate weeks.

Engineering 81.411 ★

Waste Management

A systematic analysis of issues dealing with solid and hazardous waste management. Waste definitions and description, collection and transportation, prevention and diversion, treatment technologies, landfilling, thermal processes.

Precludes additional credit for Engineering 81.401 ★ and 81.407 ★.

Prerequisites: Engineering 81.301 ★, 81.302 ★ and 81.304 ★.

Lectures three hours a week, problem analysis one hour a week.

Engineering 81.414 ★

Environmental Planning and Impact Assessment

Environmental planning and management of residuals. Environmental standards and marketable rights. Risk Assessment, policy development and decision-making. Fault-tree analysis. Canada and U.S. environmental regulations. Framework for Environmental Impact Assessment, survey of techniques for impact assessment and EIA review process. Case studies of selected engineering projects.

Precludes additional credit for Engineering 81.404 ★ and 81.408 ★.

Prerequisite: Fourth-year registration in the Environmental Engineering program.

Lectures three hours a week, problem analysis three hours alternate weeks.

Engineering 81.497

Engineering Project

A major project in engineering analysis, design, development or research carried out by individual students or small teams. The objective is to provide an opportunity to develop initiative, self-reliance, creative ability and engineering judgement. A project proposal, an interim report, an oral presentation, and a comprehensive final report are required.

School for Languages, Literatures and Comparative Literary Studies

Classics

(Arts and Social Sciences)

1416 Dunton Tower
Telephone: 520-5644

Teaching Staff

Professor

R.C. Blockley, B.A.(Leicester), M.A.(McMaster), Ph.D.(Nottingham)

Associate Professors

D.G. Beer, B.A. (Bristol), M.A. (McMaster), • **R. Jeffreys**, B.A.(London), M.A.(McMaster), Ph.D.(London)

Distinguished Research Professor

Trevor Hodge

Adjunct Professors

A.S. Fotiou • **T.R. Robinson** • **Carl Widstrand**

General Information

Students currently enrolled in degree programs offered by the Classics discipline should contact the School regarding their remaining requirements.

Minor in Classics

A Minor in Classics requires 4.0 credits in Classics, with a GPA of 4.0 or better, including:

1. First-Year Seminar 01.116 or 1.0 credit in Classical Civilization or Greek or Latin at the 100-level.
2. At least one of 13.200 or 13.209 (18.209).
3. At least one of 13.290 (24.290) or 13.291 (or 24.291).
4. 1.0 credit in Classical Civilization at the 300-level or 1.0 credit in Greek or Latin at the 200 level (or above).

A minimum of 2.0 credits must be taken at Carleton.

Requirement for Breadth, for students in B.A. or B.A.(Honours) degrees

Category for Breadth	Courses in this unit
The temporal dimension of human societies, analyzing times before the present era or societies other than our own	All Classics courses not listed in any other category; all courses in Greek; all courses in Latin
The artifacts of the imagination in literature and/or other forms, or that addresses the life of the imagination and culture.	(13.)200, 209
The understanding of social, technological and/or natural processes and the ways in which that understanding is obtained in science and social science.	(13.)235
Matters of human values, ethics and social responsibilities	(13.)206 ★

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

• Classical Civilization

First-Year Seminar in Classics 01.116

Issues in Classical Civilization

An investigation of important issues relating to the Greek and Roman world. Themes will be drawn from literature, history, art, religion and social life. All texts are in English. Limited enrolment. Precludes additional credit for Classical Civilization 13.100, 13.102 ★ and 13.103 ★.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

Classical Civilization 13.100

Introduction to Classical Civilization

An introduction to the study of Greek and Roman antiquity and to the discipline of Classics and its methodologies. The culture and society will be set in their historical context and studied through readings from representative ancient authors (in English translation) and through the art and architecture of the period.

Precludes additional credit for First-Year Seminar 01.116, Classical Civilization 13.102 ★, 13.103 ★, and 13.119.

Lectures two hours a week.

Classical Civilization 13.102 ★

Introduction to Greek Civilization

An introduction to the study of Greek antiquity and the discipline of Classics and its methodologies. The culture and society will be set in their historical context and studied through readings from representative ancient authors (in English translation) and through the art and architecture of the period.

Precludes additional credit for First-Year Seminar 01.116, Classical Civilization 13.100, and 13.119.

Lectures two hours a week.

Classical Civilization 13.103 ★

Introduction to Roman Civilization

An introduction to the study of Roman antiquity and the discipline of Classics and its methodologies. The culture and society will be set in their historical context and studied through readings from representative ancient authors (in English translation) and

through the art and architecture of the period.

Precludes additional credit for First-Year Seminar 01.116, Classical Civilization 13.100, and 13.119.

Lectures two hours a week.

Classical Civilization 13.200

Classical Mythology

A study of classical mythology, emphasizing its use in Greek and Roman literature and its place in classical art and religion. There is some discussion of classical myths in terms of contemporary interpretations of myth. (All texts used will be in English).

Precludes additional credit for Classical Civilization 13.300.

Prerequisite: Second-year standing or registration in the B.Hum. program or permission of the School.

Lectures and discussion three hours a week.

Classical Civilization 13.206 ★

Greek Philosophy: Plato and Aristotle

A study, both historical and critical, of some central issues in the philosophy of Plato and of Aristotle. (Also listed as Philosophy 32.206 ★).

Precludes additional credit for Philosophy 32.205.

Prerequisite: At least 0.5 credit in Philosophy or Second-year standing.

Lectures three hours a week.

Classical Civilization 13.207 ★

Hellenistic and Early Medieval Philosophy

The evolution of western philosophy from the fourth through the twelfth century: theories of human nature, knowledge and reality are traced from the Hellenistic philosophers through the early medieval synthesis of reason with Christianity. Several thinkers (e.g. Plotinus, Augustine, and Anselm) are studied in depth. (Also listed as Philosophy 32.207 ★)

Precludes additional credit for Philosophy 32.225.

Prerequisite: Classical Civilization 13.206 ★ or permission of the Philosophy department.

Lectures three hours a week.

Classical Civilization 13.209

Greek and Roman Literary Genres

A study through English translation of the various genres of Greek and Latin literature, especially those which influenced later European writings: epic, drama, the ode, pastoral poetry, satire. (Also listed as English 18.209.)

Prerequisite: Second-year standing or permission of the School.

Lectures two hours a week.

Classical Civilization 13.230

Methods and Techniques of Archaeology

The interrelation of archaeology and anthropology, history, classics, art history, etc. Techniques of field archaeology such as stratigraphy, air photography, surveying, Carbon 14, typology and seriation, underwater archaeology, laboratory analysis; and the organization and administration of a major excavation.

Precludes additional credit for Classical Civilization 13.231.

Prerequisite: Second-year standing or permission of the School.

Lectures two hours a week.

Classical Civilization 13.235

Ancient Science and Technology

The development of science and technology in the ancient world and their practical application in such fields as ancient engineering, machinery, metallurgy, transport, building, agriculture and Hippocratic medicine; the position of the craftsman and artisan in society, the attitude of the intellectuals to science and manual labour, and the effect upon technological development of the institution of slavery. This course is suitable for students with no previous knowledge of Greece or Rome.

Prerequisite: Second-year standing or permission of the School.

Lectures two hours a week.

Classical Civilization 13.290

History of Ancient Greece

The history of classical Greece to the conquest of Asia by Alexander with special attention to the development of her characteristic institutions. (Also listed as History 24.290.)

Prerequisite: Second-year standing or permission of the School.

Lectures two hours a week.

Classical Civilization 13.291

History of Ancient Rome

The history of ancient Rome, her organization and expansion especially during the late Republic and early Empire. (Also listed as History 24.291.)

Prerequisite: Second-year standing or permission of the School.

Lectures two hours a week.

Classical Civilization 13.301 ★

Early Greek Philosophy

A study of the presocratic Greek philosophers and of the Sophists and Socrates. (Also listed as Philosophy 32.301 ★).

Precludes additional credit for Philosophy 32.205.

Prerequisite: Classical Civilization 13.206 ★ or permission of the Philosophy department.

Lecture three hours a week.

Classical Civilization 13.302

The Later Roman Empire

The study of major developments - administrative, ecclesiastical, cultural and societal - of the later Roman Empire. (Also listed as History 24.302.)

Prerequisite: A 200-level Classical Civilization course.

Lectures three hours a week.

Classical Civilization 13.321 ★

Studies in Greek History and Institutions

A study of one of the major periods or themes of ancient Greek history. Topic for 1999-2000: Greek Democracy. (Also listed as History 24.309 ★)

Prerequisite: Classical Civilization 13.290 or permission of the School.

Lectures two hours a week.

Classical Civilization 13.322 ★

Studies in Roman History and Institutions

A study of one of the major periods or themes of the history of ancient Rome. Topic for 1999-2000: The Julio-Claudian dynasty. (Also listed as History 24.311 ★.)

Prerequisite: Classical Civilization 13.291 or permission of the School.

Lectures two hours a week.

Classical Civilization 13.330

Archaeological Field Work

Students will participate for a minimum of five weeks in the excavation of an archaeological site. In addition they will study stratigraphic analysis and the recording and processing of finds. Written reports on specific aspects of the particular excavation are required.

Prerequisites: Classical Civilization 13.230 (old 13.231) and permission of the School, or permission of the School.

Classical Civilization 13.334 ★

Etruscan and Roman Art

This course studies Etruscan art and the development of Roman art and architecture through the Constantinian period. (Also listed as Art History 11.310 ★.)

Prerequisite: Second-year standing or permission of the School.

Lectures three hours a week.

Classical Civilization 13.335 ★

Studies in Greek and Roman Art and Archaeology

A study of a period or theme in the art and archaeology of Ancient Greece and Rome. Topics may vary from year to year. (Also listed as Art History 11.311 ★.)

Prerequisite: Second-year standing or permission of the School.
Lectures three hours a week.

Classical Civilization 13.371 ★

Studies in Greek Literature

A study of an author or topic in Greek literature.

Prerequisite: Second-year standing or permission of the School.
Lectures two hours a week.

Classical Civilization 13.372 ★

Studies in Roman Literature

A study of an author or topic in Roman literature.

Prerequisite: Second-year standing or permission of the School.
Lectures two hours a week.

Classical Civilization 13.390 ★

Directed Studies

Supervised readings and research projects chosen in consultation with the Supervisor of Undergraduate Studies.

Prerequisite: Third-year standing or permission of the School.

Classical Civilization 13.391 ★

Directed Studies

Supervised readings and research projects chosen in consultation with the Supervisor of Undergraduate Studies.

Prerequisite: Third-year standing or permission of the School.

Classical Civilization 13.402

Beginnings of Early Medieval Europe and the Near East

A seminar on the transformation of the later Roman world into the politics of early Medieval Europe and the Near East. (Also listed as History 24.402.)

Prerequisite: Permission of the School.
Seminar three hours a week.

Classical Civilization 13.427

Selected Topics in Classical History and Literature

A seminar on historical and literary aspects of a particular period of antiquity. Intended for Third- and Fourth-year students.

Prerequisites: Classical Civilization 13.209, one of 13.290, 13.291, 13.321 ★, 13.322 ★; and permission of the School.
Seminar two hours a week.

Classical Civilization 13.428

Selected Topics in Greek and Roman Literature

Intended for Third- and Fourth-year students. Topic for 1999-2000: Greek Tragedy.

Prerequisites: Classical Civilization 13.209 and permission of the School.
Seminar two hours a week.

Classical Civilization 13.429

Selected Topics in Greek and Roman History

Intended for Honours students in History and Classics who should normally be in the Third- or Fourth-years. (Also listed as History 24.429.)

Prerequisites: Classical Civilization 13.290 or 13.291 or 13.321 ★ or 13.322 ★ and permission of the School.
Seminar two hours a week.

Classical Civilization 13.430

Archaeological Field Work (Advanced)

Students will participate for a minimum of five weeks in a position of responsibility in the excavation of an archaeological site. They will be responsible for excavating and for the recording, processing and analysis of finds. A specialized report on a particular aspect of the excavation is required.

Prerequisites: Classical Civilization 13.330 and permission of the School.

Classical Civilization 13.490 ★

Directed Readings and Research

These courses consist of supervised readings and research projects in a specific area of Classical Civilization to be chosen in consultation with the Honours Supervisor.

Prerequisites: Fourth-year Honours standing and permission of the School.

Classical Civilization 13.491 ★

Directed Readings and Research

These courses consist of supervised readings and research projects in a specific area of Classical Civilization to be chosen in consultation with the Honours Supervisor.

Prerequisites: Fourth-year Honours standing and permission of the School.

Classical Civilization 13.492 ★

Directed Readings and Research

These courses consist of supervised readings and research projects in a specific area of Classical Civilization to be chosen in consultation with the Honours Supervisor.

Prerequisites: Fourth-year Honours standing and permission of the School.

• Greek

Greek 15.105 ★

Introduction to Classical Greek I

A course for beginners in ancient Greek, designed to give students a grasp of basic grammatical forms and vocabulary (with reference to English derivatives) through the reading of continuous Greek. Lectures and practice periods four hours a week.

Greek 15.106 ★

Introduction to Classical Greek II

A course for students with some previous knowledge of the language: study of grammatical forms and constructions; acquisition of reading skills.

Prerequisite: Greek 15.105 ★ or equivalent.
Lectures and practice periods four hours a week.

Greek 15.220 ★

Intermediate Classical Greek I

Further study of the language; introduction to the reading of ancient Greek authors.

Prerequisite: Greek 15.106 ★ or equivalent.
Precludes additional credit for Greek 15.201.
Tutorials three hours a week.

Greek 15.221 ★

Intermediate Classical Greek II

Continued study of the language; reading of selected prose and poetry by ancient Greek authors; development of translation skills.

Prerequisite: Greek 15.220 ★ or equivalent.
Precludes additional credit for Greek 15.201.
Tutorials three hours a week.

Greek 15.390 ★

Studies in Greek Poetry

Reading and critical discussion of selections from ancient Greek poetry.

Prerequisite: Greek 15.221 ★ or equivalent.
Tutorials three hours a week.

Greek 15.391 ★

Studies in Greek Prose

Reading and critical discussion of selections from ancient Greek prose.

Prerequisite: Greek 15.221 ★ or equivalent.
Tutorials three hours a week.

Greek 15.490 ★

Directed Study (Poetry)

Greek 15.491 ★

Directed Study (Prose)

• **Latin**

Latin 16.105 ★

Introduction to Latin I

A course for beginners in Latin, designed to give students a grasp of basic grammatical forms and vocabulary (with reference to English derivatives) through the reading of continuous Latin. Lectures and practice periods four hours a week.

Latin 16.106 ★

Introduction to Latin II

A course for students with some previous knowledge of the language: study of grammatical forms and constructions; acquisition of reading skills.

Prerequisite: Latin 16.105 ★ or equivalent.

Lectures and practice periods four hours a week.

Latin 16.115

Beginning Latin

Latin 16.201

Intermediate Latin

Further study of the language; reading of selected prose and poetry by Latin authors.

Prerequisite: Latin 16.106 ★ or equivalent.

Lectures three hours a week.

Latin 16.220 ★

Intermediate Latin I

Further study of the language; introduction to the reading of Latin authors.

Prerequisite: Latin 16.106 ★ or equivalent.

Precludes additional credit for Latin 16.201.

Tutorials three hours a week.

Latin 16.221 ★

Intermediate Latin II

Continued study of the language; reading of selected prose and poetry by Latin authors; development of translation skills.

Precludes additional credit for Latin 16.201.

Prerequisite: Latin 16.220 ★ or equivalent.

Tutorials three hours a week.

Latin 16.250 ★

Translation I

A course designed to improve the students' proficiency in sight translation from Latin and to give practice in translation from English into Latin (prose composition).

Prerequisite: Latin 16.201 or permission of the School.

Tutorials three hours a week.

Latin 16.390 ★

Studies in Latin Poetry

Reading and critical discussion of selections from Latin poetry.

Prerequisite: Latin 16.221 ★ or equivalent.

Tutorials three hours a week.

Latin 16.391 ★

Studies in Latin Prose

Reading and critical discussion of selections from Latin prose.

Prerequisite: Latin 16.221 ★ or equivalent.

Tutorials three hours a week.

Latin 16.490 ★

Directed Study (Poetry)

Latin 16.491 ★

Directed Study (Prose)

Cognitive Science (Arts and Social Sciences)

2216 Dunton Tower
Telephone: 520-2368 or 520-2807

Academic Administration

Program Co-ordinator, Ann Stuart Laubstein

Members of the Committee

Ann Laubstein • Helmut Zobl • William Petrusic • Chris Herdman • John Logan • Franz Oppacher • Jean-Pierre Corriveau • Andrew Brook, Chair

General Information

Cognitive Science is a multi-disciplinary approach to the study of human cognition, perception, emotion and so on. First mooted as a branch of knowledge with the development of computers in the years following WWII, it took on an identity as a separate discipline in the mid-1970's. Now found at over 150 universities worldwide, Philosophy, Linguistics, Psychology and Computer Science have always been major contributors to its work. At Carleton, all four disciplines contribute directly to the undergraduate program. Other academic units such as Sociology/Anthropology and Biology offer highly relevant courses. Going all the way from the abstract study of concepts of cognition at one end to well-defined empirical research into language and cognition and the specifics of modelling cognition on computers on the other, Cognitive Science presents a unique opportunity to study four major approaches to human cognition, perception, etc. at the same time. In addition to a satisfactory overview of the four approaches together, the Carleton program also offers students an opportunity to acquire deeper knowledge of one of them. This feature of Carleton's program greatly expands the range of options open to graduates of the program.

The program is administered by the Institute of Interdisciplinary Studies (see p. 300 for the Institute's general listing).

Admission Requirements

The admission requirements for Cognitive Science may be higher than those for Honours programs as a whole. It is likely that the number of places will be limited, so early application is recommended.

Graduation Requirements

In order to graduate, students must fulfill all University graduation regulations (see p. 48), all Faculty regulations, including those relating to First-Year Seminars (see p. 63), and all Major regulations and requirements set out below.

B.A.(Honours) Program

Carleton offers only a B.A.(Honours) program in Cognitive Science. This program consists of three elements: a core of courses taken by all students (9.5 credits); an area of specialization, selected from the five areas of specialization listed immediately below (5.0 or 5.5 credits); and free options to a total of 20.0 credits. The five areas of specialization are: Philosophical and Conceptual Issues; Language and Linguistics; the Biological Foundations of Cognition; Cognition and Psychology; and Cognition and Computation.

Note: Students are not required to complete courses in the order listed. The division into years is merely a guideline. However, stu-

dents should take prerequisite courses early enough in their program to ensure that they can take upper-year courses when they wish to do so.

Core Courses

Cognitive Science: 07.201 ★, 07.301 ★

Computer Science: 95.105 ★, 95.106 ★, 95.185 ★, 95.202 ★, 95.307 ★

Linguistics: 29.100, 29.201 ★, 29.203 ★, 29.356 ★

Philosophy: 32.151 ★ (recommended but not required), 32.201 ★ or 32.336 ★, 32.252 ★

Psychology: 49.101 ★, 49.102 ★, 49.220 ★, 49.270 ★

Required credits from the chosen area of specialization.

Fourth Year: 95.407 ★, Honours essay, 1.0 Fourth-year credit and additional required credits, if any, from the chosen area of specialization.

Areas of Specialization

Philosophical and Conceptual Issues

• 32.332 ★, 32.351 ★, 32.354 ★, 32.356 ★, 32.451 ★

• One of: 32.401 ★, 32.402 ★, 32.411 ★, 32.421 ★, 32.431 ★

• 07.498

Language and Linguistics

• 29.302 ★, 29.304 ★

• Four of: 29.241 ★, 29.263 ★, 29.264 ★, 29.271 ★, 29.361 ★, 29.311 ★, 29.393 ★

• Two of: 29.401 ★, 29.402 ★, 29.409 ★, 29.462 ★

• 07.498

The Biological Foundations of Cognition

• 49.200, 49.300, 49.320

• One of: 49.322 ★ or 49.372 ★, (49.322 ★ recommended)

• 1.0 credit at the Fourth-year level or above, to be chosen in consultation with the Co-ordinator

• 07.498

Cognition and Psychology

• 49.200, 49.300, 49.370

• One of: 49.322 or 49.372 ★, (49.372 ★ recommended)

• 1.0 credit at the Fourth-year level or above, to be chosen in consultation with the Co-ordinator

• 07.498

Cognition and Computation

• 95.102 ★, 95.302 ★, 95.402 ★

- 1.5 additional Second-year credits or above in Computer Science, chosen in consultation with the Co-ordinator
- 1.0 Fourth-year credit or above in Computer Science, chosen in consultation with the Co-ordinator
- 07.498

Prerequisites

Students should check the prerequisites for courses carefully, especially in their area of specialization, to ensure that by the year in which they wish to enroll in a given course, they have all prerequisites of that course.

The Honours Essay must be done in a student's area of specialization. To enroll in 07.498, a student must have satisfied all the requirements of that area of specialization except those of fourth-year.

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Cognitive Science 07.201 ★

History of Cognitive Science

A survey of the history and development of cognitive science as a separate branch of knowledge, from its roots in cybernetics and theory of computation in the late 1940's to the large multi-disciplinary, multi-national teaching and research program it has now become.

Prerequisite: Second-year standing or permission of the Institute. Seminar three hours a week.

Cognitive Science 07.301 ★

Elements of Cognitive Science

Selected topics in cognitive science covered from the perspectives of psychology, computer science, linguistics, philosophy and other related disciplines.

Precludes additional credit for Cognitive Science 04.101 ★.

Lectures three hours a week.

Interdisciplinary 07.498

Honours Project

Interdisciplinary research project for Honours students in the Fourth year of all IIS programs. In selecting a project, students must consult their Program Coordinator. Only the Program Coordinator can assign a supervisor or grant approval to register in this course. Faculty regulations governing Honours Research Essays and Honours Theses apply (see p. 67).

Registration in this course is limited to students in the Fourth year of a B.A.(Honours) program in IIS.

Comparative Literary Studies (Arts and Social Sciences)

1416 Dunton Tower
Telephone: 520-5644
Fax: 520-3544

Teaching Staff

Professor Emeritus

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Professors

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• **Jutta Goheen**, Dr. Phil.(Potsdam) • **F.J. Hernandez**, Lic.Fa.Letras(Barcelona), M.A., Ph.D.(Toronto) • **Francesco G. Lorrigo**,
B.A.(British Columbia), M.A., Ph.D.(California at Los Angeles) • **Patricia Smart**, B.A.(Toronto), M.A.(Laval), Ph.D.(Queen's), F.R.S.C.

Associate Professors

Arnd Bohm, B.A., M.A.(Alberta), Ph.D.(Johns Hopkins) • **Gurli A. Woods**, Forprove (Aarhus), Ph.D.(British Columbia)

Adjunct Research Professors

J. Bessiere • **A. de Toro** • **P. Imbert** • **W. Krynski** • **P. Laurette** • **R. Polzin** • **A. Ponzio** • **B. Rutland** • **H. Sullivan** • **J. L. Urbina**

General Information

Students currently enrolled in degree programs offered by the Discipline of Comparative Literary Studies are governed by the requirements contained in the 1997-98 Undergraduate Calendar.

Requirement for Breadth, for students in B.A. or B.A.(Honours) degrees

Category for Breadth	Courses in this unit
The temporal dimension of human societies, analyzing times before the present era or societies other than our own	(17.)207★, 208★
The artifacts of the imagination in literature and/or other forms, or that addresses the life of the imagination and culture.	All Comparative Literary Courses not listed in any other category
The understanding of social, technological and/or natural processes and the ways in which that understanding is obtained in science and social science.	
Matters of human values, ethics and social responsibilities	

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

First-Year Seminar in Comparative Literary Studies 01.150

The Literatures of Europe: Representative Texts

Study of major literary traditions in Europe and their interrelations from antiquity to the present. Authors, such as Homer, Sophocles, Vergil, Dante, Boccaccio, Machiavelli, Cervantes, Molière, Goethe,

Flaubert, Austen, Dostoevsky, Proust, Joyce, Pirandello, Kafka, Woolf, Calvino. All texts in English. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminar three hours a week

Comparative Literary Studies 17.100

The Literatures of Europe: Representative Texts

Study of major literary traditions in Europe and their interrelations from antiquity to the present. Authors, such as Homer, Sophocles, Vergil, Dante, Boccaccio, Machiavelli, Cervantes, Molière, Goethe, Flaubert, Austen, Dostoevsky, Proust, Joyce, Pirandello, Kafka, Woolf, Calvino. All texts in English.

Lectures and seminar three hours a week.

Comparative Literary Studies 17.201

The Literatures of the Americas: Comparative Perspectives

Through the analysis of representative texts from the 19th and 20th centuries, the course will examine issues pertaining to the interrelation between the literatures of North and South America. All texts in English. Topics may vary from year to year.

Prerequisite: Second-year standing or permission of the Discipline. Lectures and seminars three hours a week.

Comparative Literary Studies 17.207★

The Literatures of Asia: Comparative Perspectives

Issues arising from the literatures of the Asian continent. Topics may vary from year to year. Texts will be read in English, which is also the language of instruction. Topic for 1999-2000 to be announced.

Prerequisite: Second-year standing or permission of the Discipline. Lectures and seminars three hours a week

Comparative Literary Studies 17.208★

The Literatures of Africa and the Middle East: Comparative Perspectives

Issues arising from the literatures of the African continent and the Middle East. Topics may vary from year to year. All texts will be read in English, which is also the language of instruction. Topic for 1999-2000 to be announced.

Prerequisite: Second-year standing or permission of the Discipline. Lectures and seminars three hours a week

Comparative Literary Studies 17.300

Themes, Genres, Periods

The comparative study of a specific theme or genre through texts drawn from several historic periods. Topics may vary from year to year. Topic for 1999-2000 to be announced. Prerequisite: Second-year standing or permission of the Discipline.
Seminar two hours a week, tutorials one hour a week.

Comparative Literary Studies 17.301

International Literary Movements

Comparative Study of primary and secondary sources which define international literary movements such as Renaissance, Romanticism, Realism, Modernism, and Post-modernism. Topics may vary from year to year. Topic for 1999-2000: Postmodernism: Comparative Perspectives.

Precludes additional credit for Comparative Literary Studies 17.200.
Prerequisite: Second-year standing or permission of the Discipline.
Seminar three hours a week.

Comparative Literary Studies 17.302

Gender and Literature

Study of autobiographical writing, novels, short stories, and poetry by women writing in the 1970s, 1980s, and 1990s in a variety of cultural settings. Cross-cultural point of view informed by poststructuralist feminist criticism. All texts available in English translation.

Prerequisite: Second-year standing or permission of the Discipline.
Seminar three hours a week.

Comparative Literary Studies 17.401 ★

Foundations of Comparative Literature

The history of the discipline of comparative literature is studied, including its beginning in nineteenth-century France, its evolution, and its current status in Europe, the United States and Canada.

Prerequisite: Permission of the Discipline.

Seminar three hours a week.

Comparative Literary Studies 17.402 ★

Theories of Literature

Twentieth-century literary theories in the context of comparative studies. Over-all view of the theoretical discussion of literature from 1920 to the present: Russian Formalism; American New Criticism; structuralist, semiotic, socio-cultural and hermeneutic approaches.

Prerequisite: Permission of the Discipline.

Note: Students enrolling in this course under the cross-listed number Spanish 38.402 ★ should note the requirements of Spanish.

Seminar three hours a week.

Computational Sciences College of Natural Sciences (Science)

2250 Herzberg Building
Telephone: 520-3515
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Academic Administration

Director, Iain Lambert

Undergraduate Advisers, John Sinclair (Computational Biochemistry), George Carmody (Computational Biology)
James Wright (Computational Chemistry)

Teaching Staff

Professors Emeriti

H.F. Howden (Biology) • **V.N. Iyer** (Biology) • **H.G. Merriam** (Biology) • **H.H.J. Nesbitt** (Biology) • **F.K. North** (Earth Sciences)

Professors

J.W. ApSimon (Chemistry) • **J.C. Armitage** (Physics) • **K. Bell** (Earth Sciences) • **R.L. Brown** (Earth Sciences) • **G.W. Buchanan** (Chemistry) • **R.K. Carnegie** (Physics) • **L.A. Copley** (Physics) • **K.W. Edwards** (Physics) • **S. Godfrey** (Physics) • **B.R. Hollebone** (Chemistry) • **P. Kruus** (Chemistry) • **M.E. McCully** (Biology) • **S. Peck** (Biology) • **G. Ranalli** (Earth Sciences) • **G.B. Skippen** (Earth Sciences) • **K.B. Storey** (Biology, Biochemistry, Chemistry) • **R.P. Taylor** (Earth Sciences) • **C.S. Tsai** (Biochemistry, Chemistry) • **D.H. Watkinson** (Earth Sciences) • **P.J.S. Watson** (Physics) • **P.J. Weatherhead** (Biology) • **D.C. Wigfield** (Chemistry) • **J. S. Wright** (Chemistry) • **R.C. Wyndham** (Biology)

Associate Professors

G.M. Atkinson (Earth Sciences) • **A.D.O. Bawagan** (Chemistry) • **J. Blenkinsop** (Earth Sciences) • **P.H. Buist** (Chemistry) • **G.R. Carmody** (Biology) • **S.D. Carr** (Earth Sciences) • **N. Chaly** (Biology) • **R.J. Crutchley** (Chemistry) • **H. Damman** (Biology) • **G.R. Dix** (Earth Sciences) • **L. Fahrig** (Biology) • **B.J. Jarosz** (Physics) • **P.C. Johns** (Physics) • **P.A. Kalyniak** (Physics) • **D.A. Karlen** (Physics) • **E.P.C. Lai** (Chemistry) • **I.B. Lambert** (Biology, Biochemistry) • **F.A. Michel** (Earth Sciences) • **R.T. Patterson** (Earth Sciences) • **L. Resnick** (Physics) • **G.E. Santyr** (Physics) • **C. Schröder-Adams** (Earth Sciences) • **R.A. Shigeishi** (Chemistry) • **J. Sinclair** (Biology, Biochemistry) • **J. Vierula** (Biology) • **Z.Y. Wang** (Chemistry)

Assistant Professors

S.A.L. Bennett (Biochemistry) • **R.C. Burk** (Chemistry) • **N. Cappucino** (Biology) • **J. Cheetham** (Biology, Biochemistry) • **M.R.L. Forbes** (Biology) • **M.L. Smith** (Biology)

Instructors

K.M. Gilmour (Biology) • **K. Henein** (Biology) • **I. Munro** (Earth Sciences) • **M. Runtz** (Biology)

Distinguished Research Professors

C.L. Chakrabarti (Chemistry) • **M.K. Sundaresan** (Physics)

Honourary Research Professors

P.G. Estabrooks (Physics) • **R.J. Hemingway** (Physics)

Adjunct Research Professors

M.H. Back (Chemistry) • **R.J. Berman**, G.S.C. • **S.P.J. Brooks**, Health Canada • **M.W. Caldwell**, Canadian Museum of Nature • **I. Cameron**, O.R.C.C. • **M.J. Canny** (Biology) • **R.L. Clarke** (Physics) • **B.L. Cousens** (Earth Sciences) • **S.L. Cumbaa**, Canadian Museum of Nature • **J. Cygler**, O.R.C.C. • **M. Dixit**, C.R.P.P. • **J.A. Donaldson** (Earth Sciences) • **O.E. Edwards** (Chemistry) • **M. Fingas**, Environment Canada • **K.E. Freemark**, Canadian Wildlife Service • **D.R. Gardner**, Carleton University • **L.H. Gerig**, O.R.C.C. • **H.L. Gibson**, Laurentian University • **W.D. Gould**, Natural Resources Canada • **C. Greenstock**, A.E.C.L. • **D.C. Gregoire**, N.R.C. • **P. Handa**, N.R.C. • **S. Hanmer**, G.S.C. • **M.D. Hannington**, G.S.C. • **C.K. Hargrove**, C.R.P.P. • **K.U. Ingold**, N.R.C. • **B.F. Johnson** (Biology) • **J. Kukalova-Peck** (Earth Sciences) • **J.F. Lawrence**, Health Canada • **D.A. Leckie**, Wascana Energy Inc. • **L. Lefkovitch**, Agriculture Canada • **M. Losty**, C.R.P.P. • **B. McKee**, Civic Hospital • **H.J.A.F. Mes**, C.R.P.P. • **B.L.A. Miki**, Agriculture Canada • **J.D. Miller** (Chemistry) • **P. Mineau**, Canadian Wildlife Service • **C. Ng**, O.R.C.C. • **A. Noble**, C.R.P.P. • **R.J. Norstrom**, Environment Canada • **G. Oakham**, C.R.P.P. • **G.P. Raaphorst**, O.R.C.C. • **R. Rainbird**, G.S.C. • **J.A. Ripmeester**, N.R.C. • **D.W.O. Rogers**, N.R.C. • **C. Ross**, N.R.C. • **V.L. Seligy**, Health Canada • **W.D. Sinclair**, C.R.P.P. • **K.W.M. Siu**, N.R.C. • **R. Stern**, G.S.C. • **R.E. Sturgeon**, N.R.C. • **R. Walker**, N.R.C. • **D.M. Wood**, Agriculture Canada • **H. Yamazaki** (Biology, Biochemistry)

Adjunct Professors

G. Chao (Earth Sciences) • **K. Hooper** (Earth Sciences) • **R.H. Wightman** (Chemistry) • **D.R. Wiles** (Chemistry) • **R. Yole** (Earth Sciences)

Sessional Lecturers

L. Campbell (Physics) • **R.S. Dick** (Physics) • **I. Ivanovic** (Physics) • **P. Wolff** (Chemistry)

General Information

Computational Sciences is a rapidly developing field relating to the direct application of computer science to natural sciences such as Biology, Biochemistry or Chemistry. Today's experimental scientists are increasingly reliant on computer science in almost every aspect of their disciplines. In order to meet the growing demand for highly trained graduates with a background in Computer Science and Mathematics in combination with intensive training in Biology, Biochemistry or Chemistry, the College of Natural Sciences offers three Honours B.Sc. programs: B.Sc (Honours) in Computational Biology, B.Sc. (Honours) in Computational Biochemistry and B.Sc (Honours) in Computational Chemistry.

Graduation Requirements

In order to graduate, students must fulfill all University graduation regulations (see p. 48) and all Faculty graduation regulations (see p. 109). In addition, students in Computational Biology must fulfill all regulations and requirements set out by the Department of Biology (see p.144), students in Computational Biochemistry must fulfill all regulations and requirements set out by the Institute of Biochemistry (see p.140) and students in Computational Chemistry must fulfill all regulations and requirements set out by the Department of Chemistry (see p.172).

Computational Science programs

Computational Biochemistry (Honours)

(see also p.141)

Program Requirements

1. 2.5 credits in Biology: 61.103★, 61.214★, 61.314★ and another 1.0 credit at the 200-level or higher;
2. 3.5 credits in Chemistry: 65.100, 65.223★, 65.224★ or 65.226★, 65.211★, 65.233★, 65.353★;
3. 3.5 credits in Biochemistry: 63.220★, 63.305★, 63.310, 63.406★, 68.499;
4. 1.0 credit in Biochemistry at the 400- level or Chemistry 65.446★ and 0.5 credit in Biochemistry at the 400- level;
5. 1.0 credit in Physics: 75.107★ and 75.108★, or 75.101★ and 75.102★;
6. 2.0 credits in Mathematics : 69.107★, 69.117★, 69.207★ and 69.217★;
7. 3.5 credits in Computer Science: 95.102★, 95.105★, 95.106★, 95.202★, 95.204★, 95.304★ or 95.305★, and 95.386★;
8. 0.5 credits in Mathematics/Computer Science: 69./95.185★;
9. 2.0 approved arts or social science credits;
10. 0.5 free option credit.

Computational Biology (Honours)

(see also p.145)

Program Requirements:

1. 5.5 credits in the Biology core: 61.103★, 61.104★, 61.210★, 61.202★, 61.214★, 61.220★ 61.260★, and 61.325★ or 61.335★, and 61.491★, 68.499;
2. 1.0 credit in Chemistry: 65.100;
3. 1.0 credit in Physics: 75.107★ and 75.108★, or 75.101★ and 75.102★;
4. 1.5 credits in Mathematics: 69.107★, 69.117★ and 69.257★;
5. 4.5 credits in Computer Science: 95.102★, 95.105★, 95.106★, 95.202★, 95.203★, 95.204★, 95.205★, and 1.0 credits from:

95.285★, 95.300★, 95.304★, 95.305★, 95.307★, 95.308★, 95.384★, 95.386★ or approved Computer Science courses;

6. 0.5 credits in Mathematics/Computer Science 69./95.185★;

7. 4.0 credits of specialization in one of the following areas of Computational Biology:

a) Specialization in Molecular Bioinformatics: 61.314★, 63.310, 63.402★, 63.406★, 61.416★, and 1.0 additional credit above the 200- level, normally in Biology or Biochemistry;

b) Specialization in Biodiversity: 61.361★, 61.362★, 61.364★, 61.413★, and 61.414★ or 61.469★ and 1.5 additional credit above the 200 -level, normally in Biology;

8. 2.0 approved arts or social science credits.

Computational Chemistry (Honours)

(see also p.173)

Program Requirements

1. 7.5 credits in Chemistry: 65.100, 65.211★, 65.212★, 65.223★, 65.226★, 65.311★, 65.312★, 65.316★, 65.321★, 65.353★, 65.354★, 65.446★, 68.499;
2. 4.5 credits in Computer Science: 95.102★, 95.105★, 95.106★, 95.202★, 95.203★, 95.204★, 95.304★, 95.305★ or 95.386★, 0.5 credit at the 300- or 400-level;
3. 1.5 credits in Mathematics 69.107★, 69.117★, 69.207★;
4. 0.5 credit in Biology: 61.103★;
5. 0.5 credit in Physics: 75.101★;
6. 1.0 credit in Biochemistry: 63.310;
7. 0.5 credit Chemistry or Biochemistry at the 300- or 400-level;
8. 0.5 credit Chemistry or Biochemistry at the 400-level;
9. 2.0 arts or social science credit;
10. 0.5 Science Option credit;
11. 1.0 credit free elective.

The Co-operative Education Option

General information on Co-op programs can be found on p. 39. Specific information regarding the Co-op options in Computational Sciences can be found on p. 145(Computational Biology), p. 141(Computational Biochemistry) and p. 173(Computational Chemistry).

Co-operative education formally integrates a student's academic experience with work experience in industry and/or government. Work opportunities, which are available on a competitive basis, are coordinated to complement the student's course work and interests. Practical work experience provides insights and opportunities for development, and helps prepare an individual for a career in Computational Science.

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Computational Sciences 68.499

Honours Research Thesis in Computational Science

An independent research project under the supervision of a Faculty adviser, applying computational techniques to some experimental or theoretical problem in the disciplinary area of the student.

Prerequisite: Permission of the Department or Institute associated with the discipline.

Computer Science

5302 Herzberg Building
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Academic Administration

Director, E. Kranakis

Associate Director and Undergraduate Adviser, F. Fiala

Supervisor of Graduate Studies, Associate Director, Ottawa-Carleton Institute for Computer Science, D. Krizanc

Co-op Faculty Advisers, L.D. Nel and I. Reichstein

Registrar, B.R. Lifeso

Teaching Staff

Professors

Frank Dehne, B.Sc., M.Sc. (Technical University of Aachen), Ph.D. (Wurzburg) • **Frantisek Fiala**, RNDr., C.Sc. (Brno) • **Evangelos Kranakis**, B.Sc. (Athens), Ph.D. (Minnesota) • **W.R. LaLonde**, B.A.Sc., M.A.Sc. (Toronto), Ph.D. (Waterloo) • **John B. Oommen**, B.Tech. (Indian Institute of Technology), M.Eng. (Indian Institute of Science), M.Sc., Ph.D. (Purdue) • **Franz Oppacher**, M.C.S. (Concordia), Ph.D. (Vienna) • **Jorg-Rudiger Sack**, Vordiplom, Diplom (Bonn), Ph.D. (McGill) • **Nicola Santoro**, D.Sc. (Pisa), Ph.D. (Waterloo)

Associate Professors

Jean-Pierre Corriveau, B.Sc., M.C.S. (Ottawa), Ph.D. (Toronto) • **S. Dandamudi**, B.E. (Mysore), M.Tech. (Indian Institute of Technology), M.Sc., Ph.D. (Saskatchewan) • **Danny Krizanc**, B.Sc. (Toronto), Ph.D. (Harvard) • **Louis D. Nel**, B.Eng. (Carleton), M.Math, Ph.D. (Waterloo) • **Ekow J. Otoo**, B.Sc. (Kumasi, Ghana), M.Sc. (Newcastle-upon-Tyne), Ph.D. (McGill) • **Irwin Reichstein**, B.Sc. (McGill), Ph.D. (Minnesota)

Assistant Professors

Steven Beauchemin, B.Sc. (Quebec a Trois-Rivieres), M.Sc., Ph.D. (Western Ontario) • **Prosenjit Bose**, B. Math, M. Math (Waterloo), Ph.D. (McGill) • **Dwight Deugo**, B.C.S., M.C.S., Ph.D. (Carleton) • **A. Maheshwari**, B.E.E.Eng, M.Sc. (Birla), Ph.D. (Bombay)

Lecturer

Francis Bordeleau, B.Sc. (Montréal), B.Sc.A (Quebec), M.C.S. (Carleton)

Instructor

Mark Lanthier, B.C.S., M.C.S. (Carleton) • **Weixuan Li** • **Cindy Sawchuk**, B.A. (Alberta), M.A. (Queen's), B.C.S., M.C.S. (Carleton)

Adjunct Research Professors

M.D. Atkinson • **J. Czyzowicz** • **H. Djidjev** • **P. Flocchini** • **A. Nayak** • **J.E. Neilson** • **A. Pelc** • **J.R. Pugh** • **G. Ravindran** • **G. Roth** • **D.A. Thomas** • **P. Van Oorschot**

General Information

The School of Computer Science offers a variety of programs and courses which together provide a wide spectrum of educational opportunities for students wishing to specialize in Computer Science. The Honours Bachelor of Computer Science (B.C.S.) program is professionally recognized and accredited by the Computer Science Accreditation Council, sponsored by CIPS, the Canadian Information Processing Society. While the School offers a Software Engineering stream of courses under the Bachelor of Computer Science degree program, it does not attempt, in any manner, to offer an Engineering program for students wishing to pursue such a profession. Nor does completion of the courses and program in Computer Science qualify anyone to work as a Professional Engineer. A co-operative education option is also available within this program allowing students to complement their academic studies with practical experience in the work-place. In addition, the School offers a combined

Bachelor of Science (B.Sc.) Honours program with the Department of Chemistry and a Combined Bachelor of Mathematics (B.Math.) Honours program with the School of Mathematics and Statistics. Students registered in either a B.Sc. (Honours) or B.Math. (Honours) degree can follow a Minor in Computer Science (see p.198). The School offers a number of introductory courses that may stand alone in a program of another field of study or be augmented by a selection of other Computer Science courses to form an area of specialization.

Programs offered at the Graduate level include the Ph.D. and Master of Computer Science (M.C.S.) program offered in conjunction

with the Ottawa-Carleton Institute for Computer Science, and the more interdisciplinary Master of Information System Science (M.Sc.) program. For details of these programs please refer to the Calendar of Graduate Studies and Research.

The School of Computer Science has a wide variety of computing equipment for student use. There are 15 laboratories: nine primarily for undergraduate courses, one dedicated to graduate students and five that are used solely for research. The School emphasizes the use of PCs to allow each student access to a powerful individual workstation, enabling the provision of a wide spectrum of computational equipment from networked microcomputer systems for student use to networked UNIX/LINUX workstations for graduate research. In addition, all students have access to the campus-wide computing facilities.

Bachelor of Computer Science (Honours), B.C.S. (Hons.) Program

The B.C.S. program is an Honours degree program in which candidates are required to complete 20.0 credits or equivalent after admission to First year. Students in the co-operative education stream are minimally required to complete an additional four work-term half course credits.

In order to provide the student with a choice of specialization, the program is designed around a core curriculum combined with a choice of four program streams. These options are designed to prepare graduates for professional careers in computer-related occupations or for advanced study at the graduate level.

Admission Requirements

First Year

The OSSD or equivalent, including six OACs, two of which must be (i) Calculus and (ii) Algebra and Geometry. An overall average of 70 percent or better is required along with an average of 70 percent or better in both Calculus and Algebra and Geometry; or the successful completion of Qualifying-University year with a GPA of 5.0 or better and including Mathematics 69.007 ★ and 69.017 ★ also with a GPA of 5.0 or better.

First Year with Co-operative Option

The OSSD or equivalent, including six OACs, two of which must be (i) Calculus and (ii) Algebra and Geometry. An overall average of 85 percent or better is required along with an average of 85 percent or better in both Calculus and Algebra and Geometry; or the successful completion of Qualifying-University year with a GPA of 11.0 or better and including Mathematics 69.007 ★ and 69.017 ★ also with a GPA of 11.0 or better. Students who do not meet these requirements on entry to the B.C.S. program may apply for admission to the Co-operative Option when they meet the requirements specified in the B.C.S. program for the School of Computer Science.

Advanced Standing

Applications for admission beyond First year will be assessed on their individual merits. Advanced standing will be granted only for those subjects assessed as being appropriate for the program and for the stream selected.

Mature Applicants

Persons who lack the normal entrance requirements as published in this Calendar may receive consideration for admission under the mature applicant policy. Applicants will normally have been away from full-time studies for a minimum of two years and must be 21 years of age, or over, by December 31 of the year in which they wish to enrol. For full details see p. 35.

Enrolment Limitation

Applicants should note that meeting the admission requirements can only establish eligibility for selection to the School of Computer Science.

Course Requirements

The program for the degree of Bachelor of Computer Science (Honours) consists of a total of 20.0 credits, normally 5.0 taken each year, including at least 7.5 Computer Science credits, 3.0 from Mathematics and Statistics, 2.5 from the Faculties of Arts and Social Sciences, an additional 2.0 from either the Faculty of Science (excluding Mathematics) or the School of Business, and to include at least 2.0 credits chosen from 400-level courses.

Because the study of Computer Science is necessarily structured, students are required to select a course of study from one of four streams in addition to those courses of the core program. The streams are:

1. Software and Computing
2. Management and Business Systems
3. Software Engineering
4. Network Computing

Relevant Courses

All courses bearing a 95 prefix carry the designation Computer Science. In addition, the following courses offered by the School of

Business and the Faculty of Engineering are relevant to the B.C.S. program, are counted as Computer Science credits and are treated as Computer Science courses in the calculation of GPAs. (See also p 200.)

Business 42.230 ★, 42.240 ★, 42.440 ★, 42.442 ★, 42.446 ★, 42.447 ★.

Engineering 94.333 ★, 94.405 ★, 94.457 ★.

Core Courses

All students enrolled in the Computer Science degree program are required to complete the following core courses:

First Year

Mathematics 69.107 ★ and 69.114 ★;

Computer Science 95.105 ★, 95.185 ★, 95.106 ★ and 95.102 ★.

Second Year

Mathematics 69.217 ★;

Computer Science 95.202 ★, 95.203 ★, 95.204 ★ and 95.285 ★.

Third Year

Mathematics 69.311 ★;

Computer Science 95.300 ★, 95.304 ★, 95.305 ★, 95.307 ★ and 95.384 ★.

Fourth Year

Computer Science 95.495 ★.

Program Streams

The Software Engineering Stream and the Network Computing Stream are specializations of the Software and Computing Stream. Students with a particular interest in Software Engineering or Network Computing are invited to select these specific streams. Through its large number of Computer Science electives, the Software and Computing Stream, on the other hand, is targeted towards students aiming for breadth in the field of Computer Science.

Software and Computing Stream

This stream is intended for students interested in the theory and practice of software, ranging from the design and implementation of large systems to the theory of computing. Example topics include: the design and analysis of algorithms, distributed and parallel computing, programming languages, operating systems, databases. The program requirements of this stream are:

First Year

1.0 credit in an experimental science.

(23.100 is strongly recommended as a Humanities elective)

Second Year

Mathematics 69.207 ★ and 69.265 ★;

0.5 additional Computer Science credit at the 200-level or above.

Third and Fourth Years

Computer Science 95.484 ★

and

1.0 additional Computer Science credit at the 300-level or above;

and

1.5 additional Computer Science credit at the 400-level.

Management and Business Systems Stream

This stream is intended for students whose interests include the application of computers to business. It is designed to prepare students for the careers in this field, with a combination of Computer Science courses and a strong component of courses selected from those offered by the School of Business. Program requirements for the Management and Business Systems stream are:

Computer Science

First Year

Business 42.101 ★ and 42.102 ★;
Economics 43.100.

Second Year

Business 42.211 ★, 42.230 ★, 42.254 ★;
Mathematics 69.257 ★.

Third Year

Business 42.343 ★ and
0.5 additional Computer Science credit at the 200-level or above;

Fourth Year

1.0 additional credits in Business at the 300-level or above;
0.5 additional credit in Business at the 400-level;
One of Mathematics 69.259 ★ or 0.5 credit in Mathematics at the 200-level or above;
1.5 additional Computer Science credit at the 400-level.

Software Engineering Stream

Software Engineering is concerned with correct, timely, reliable and secure operations on information; with its communication, storage and presentation; with rapid, economical and correct development of software; and with understanding and satisfying user requirements. This stream is intended for students interested in acquiring a solid background in Computer Science as well as depth in both the foundations and the practice of Software Engineering.

The program requirements of this stream are:

First Year

1.0 credit in an experimental science.
(23.100 ★ is strongly recommended as a Humanities elective)

Second Year

Mathematics 69.207 ★ and 69.265 ★;
Computer Science 95.205 ★;
0.5 credit in Computer Science (at 200-level or above).

Third and Fourth Years

Computer Science 95.314 ★, 95.404 ★, 95.411 ★, 95.414 ★, 95.484 ★, 94.333 ★
(Business 42.447 ★ is also strongly recommended)

Network Computing Stream

This stream is intended for students interested in the specific challenges of computing in a networked (distributed) environment, ranging from the design and implementation of parallel and distributed algorithms, to the architecture and workings of client/server systems. The program requirements of this stream are:

First Year

1.0 credit in an experimental science.
(23.100 ★ is strongly recommended as an Humanities elective)

Second Year

Mathematics 69.207 ★ and 69.265 ★;
Computer Science 95.205 ★;
0.5 credit in Computer Science (at 200 level or above).

Third and Fourth Years

Computer Science 95.323 ★, 95.401 ★, 95.409 ★, 95.411 ★, 95.413 ★, 95.484 ★

Counselling

Every student in the Bachelor of Computer Science degree program is encouraged to contact the School of Computer Science Undergraduate Adviser with any question related to the program.

Experimental Science Credits

The following courses are acceptable as Science courses for Computer Science students but not as experimental science courses: Biology 61.190, 61.192 ★, 61.216 ★, 61.262 ★, 61.393 ★, Chemistry 65.103 ★, 65.107, Geology 67.104 ★, 67.383 ★, Physics 75.190, 75.195, Science 60.100, 60.200.

Minor in Computer Science

Students registered for the B.Sc. (Honours) degree or for the B.Math. (Honours) degree may take a minor in Computer Science. The minor consists of 4.0 credits, to be successfully completed with a GPA of 6.5 or better: 95.105 ★, 95.106 ★, 95.102 ★, 95.185 ★, 95.202 ★, 95.204 ★, one of 95.304 ★ or 95.305 ★, and 69/95.386 ★.

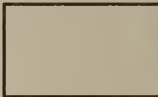


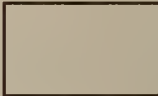


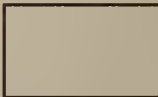


The Co-operative Education Option


General information on Co-op programs can be found on p. 39.


The Work/Study Sequence

Students admitted to the Co-operative option normally enter the work-place for their first work term on completion of year two in the B.C.S. program. The normal mode of operation requires two eight-month (or double) work terms and one four-month (or single) work term as shown on this page.

Students in the Co-operative option will require 56 months to complete their program as opposed to 44 months in the regular Honours program. Variations in the work study sequence may be requested due to academic or work situations in upper years. Precise start and finish dates for work terms are established in consultation with Co-operative employers.

	Term		
	Summer	Fall	Winter
Year 3			
Year 4			
Year 5			

 Academic

 Work Terms

Co-operative Option Admission Requirements and Registration Information

Admission into the Co-operative Option can occur:

1. directly upon being accepted to the First year of the B.C.S. program, for a student meeting requirements for the First year with Co-operative Option given on page 197.
2. from within the B.C.S. program, normally in the Second year, for a student who:
 - a) has a cumulative GPA of 8.0 or better in Computer Science and 6.5 or better overall;
 - b) has successfully completed 3.0 required credits in Computer Science, including one of 95.202 ★ or 95.204 ★;
 - c) is registered as a full-time student;

d) is eligible to work in Canada.

Note that meeting the above requirements only establishes eligibility for admission to the program. Enrolment in the Co-operative Option is limited.

Application forms for admission to the Co-operative Option are available from the Co-op Office for Engineering and Science. Completed applications should be submitted to that office by January 8, May 8 and September 8 for the respective work terms. Admission decisions are based on GPA and other requirements being met by the end of the previous term.

Eligibility for Placement in the First Work Term of the Co-operative Option

To be eligible for placement in the first work term of the Co-operative Option a student must meet the four above requirements a) through d) by the end of the term preceding the first job placement process.

Work Term Placement After First Year

Students who have been accepted into the Co-operative Option in First year may be given the opportunity to take part in a work term at the end of their First year. To be eligible for placement, students must at the end of their first term of study:

- a) have a cumulative GPA of 11.0 or better in Computer Science and 11.0 or better overall;
- b) have successfully completed 1.0 credit in Computer Science;
- c) be registered as a full-time student;
- d) be eligible to work in Canada.

Registration

During a work term, co-operative students will register in one of five co-operative work term report courses; Computer Science 95.320 ★, 95.321 ★, 95.322 ★, 95.420 ★, or 95.421 ★. While on a work term, students are limited to an additional 0.5 credit course, unless they have written support from their employer to take 1.0 credit.

Change of Work Term — Academic Term Sequence

Upon entry to the Co-operative program, a student is expected to follow the prescribed work term/academic term sequence. However, applications to change the sequence will be considered by the School.

Combined Honours B.Sc. Programs

A Combined Honours program must include a minimum of 6.0 credits in Computer Science. These requirements can be satisfied as follows:

Computer Science and Mathematics

Students in this program follow the prescribed Combined Honours B.Sc. program outlined on p. 340. The program features equal emphasis on Mathematics and Computer Science.

Computer Science and Chemistry

Students in this program follow the prescribed Combined Honours B.Sc. program outlined on p. 173. The program features equal emphasis on Chemistry and Computer Science.

Introductory Courses

Of the eight 100-level courses offered in Computer Science, four are entry-level courses, viz., Computer Science 95.101 ★, 95.104 ★, 95.105 ★, and 95.107 ★. Computer Science 95.102 ★, 95.106 ★ and 95.108 ★ are second-level courses and should not be attempted unless one of the entry-level courses has been successfully completed. Computer Science 95.102 ★ is a second-level course which requires previous programming experience in a high-level language,

which may be acquired by successful completion of an entry-level course or the equivalent. Computer Science 95.185 ★ requires one of the entry-level Computer Science courses (which may be taken concurrently).

With respect to the entry-level courses, students are expected to take only one. Specifically, students in the B.C.S. program or in a combined computer science program should note that credit will not be given for Computer Science 95.101 ★ or 95.104 ★, nor can credit be given for more than one of Computer Science 95.105 ★ or 95.107 ★. In selecting an entry-level course, students should take into account the following:

1. Computer Science 95.101 ★ is designed specifically for Arts and Social Sciences students and may not be taken for credit by students in Computer Science, Science, Mathematics, or Engineering.
2. Computer Science 95.104 ★ is designed specifically for Science students and may not be taken for credit by students in Computer Science or Engineering.
3. Computer Science 95.105 ★ is an entry-level course designed specifically for students in Computer Science or other disciplines who intend further studies in computer science. It is not a stand-alone course and should not be chosen by students who do not plan to continue studies in computer science.

Note: Business 42.142 ★, 42.242 ★, and Social Sciences 03.300 ★ may not be taken for credit by students in Computer Science.

Academic Standing

Grading System

Standing in courses will be shown by alphabetical grades. (See p. 47.)

Standings to represent special circumstances are as follows:

Aeg

Pass standing granted although absent from final examinations. Aegrotat standing is granted only by the School of Computer Science Committee on Admission and Studies in response to a student's written request. It will be granted only in exceptional circumstances and if the term work has been of high quality.

Cb

Credit granted under the Challenge for Credit policy.

F

Failure. No academic credit.

Wdn

Withdrawn in good standing. No academic credit.

Abs

Failure due to absence from the final examination where the necessary term work has been completed. No academic credit.

Def

Students who are absent from final examinations or who are unable to complete their course work for medical or compassionate reasons may apply to the School of Computer Science Committee on Admission and Studies for deferred examination privileges.

IP

In progress.

Sat

Satisfactory.

Uns

Unsatisfactory.

Computation of Averages

Using the 12-point system, the grade points earned in any specific course are determined by multiplying the grade points correspond-

ing to a grade by the credit value of the course. GPAs are calculated by dividing the total accumulated grade points by the total credits. Overall averages are calculated on the grades earned in all courses applicable to the degree.

Computer Science GPAs involve only those courses listed or cross-listed as Computer Science and those courses offered by the School of Business and the Faculty of Engineering that are counted as Computer Science credits. A list of these courses can be found in the section entitled Other Relevant Courses, p. 197. Work Term Report Courses are not included in the computation of averages.

Unless otherwise indicated, courses are one full credit, indicated 1.0 on all record documents. Courses marked ★ are half-credits, indicated 0.5 on documents.

Course Load

The normal course load for a full-time student in the School of Computer Science, during the Fall/Winter session, is the equivalent of 5.0 credits. The normal maximum course load for a part-time student, in the Fall/Winter session, is the equivalent of 2.0 credits.

Students may register for a maximum of 2.0 credits in the Summer session.

A student in good standing may exceed the normal course load only with the recommendation of the Director of the School of Computer Science.

Promotion from First Year

Full-time students in First year, in order not to fail their year in May, must, by then, have passed at least 3.0 credits or equivalent. To be promoted to the course credit system, a full-time student must pass, by the end of August, at least 4.0 credits from the First year of his or her chosen stream, including at least one credit in Computer Science, with a GPA of 6.5 or better in Computer Science courses and at 5.0 or better overall. (GPAs are to include any failing grades.) Part-time students must meet the same grade-point standards and pass at least 4.0 of the first 6.0 approved credits attempted.

For all students, promotion to the course-credit system must be accomplished in not more than three calendar years from the date of first registration in the B.C.S. program.

A student who fails to meet these promotion requirements is deemed to have failed First year and must forfeit credit for courses with grades of less than C- and is required to withdraw from the B.C.S. program. Such students are eligible to re-apply for admission and, if admitted, will repeat First year without encumbrances, retaining credit towards their degree (but not towards completion of First year) for all courses graded C- or better. A student who fails First year a second time forfeits his or her undergraduate status in the B.C.S. program and is ineligible for any further registration in the B.C.S. program.

Course Credit System

Students meeting promotion requirements at the end of First year will proceed on the course credit system. Under this system there is no promotion from one year to the next.

After promotion to the course credit system, a student may accumulate a maximum of 3.0 credits in repeated courses or course replacements.

To continue in the B.C.S. program, a student must, by the end of August each year, have gained credit in the past 12 months towards the B.C.S. degree and have a cumulative GPA of 6.5 or better in Computer Science courses and 5.0 or better overall. (GPAs are to include any failing grades.) Failure to comply with these standards requires withdrawal from the program. Such students may, however, be eligible to transfer into another degree program. Guidance

of the Registrar of the School of Computer Science should be sought in such cases.

To continue in the Co-operative stream of the Bachelor of Computer Science program, a student must, by the end of August each year, have gained at least 2.0 academic credits (other than work term report credits) during the past 12 months towards the B.C.S. degree and have a cumulative GPA of 8.0 or better in Computer Science and 6.5 or better overall; (GPAs are to include any failing grades). Failure to meet these standards requires withdrawal from the Co-operative option. Students required to withdraw from the Co-operative option are eligible to continue in the regular Bachelor of Computer Science program provided they meet the academic standards required for continuation in this program.

Examinations

General regulations on examinations are on p. 48. In addition, the following regulation applies to students in the B.C.S. program.

Deferred Examinations

Students unable to write a final examination because of illness or for compassionate reasons may apply within one week after the final examination to the School of Computer Science Registrar's office for permission to write a deferred examination. Permission can be granted only if the absence is fully and specifically supported by a medical certificate or other documents.

Graduation

University Graduation Requirements

See p. 48.

Application to Graduate

Students expecting to graduate in the Spring must make application on the form available in the School Registrar's office by February 1; those expecting to graduate in the Fall, by September 1; and those expecting to graduate in February, by December 1.

Graduation Requirements

To qualify for graduation with a Bachelor of Computer Science degree with Honours a student must:

1. present at least 20.0 approved credits beyond Qualifying-University year, including at least 13.0 credits at the 200-level or higher;
2. meet the program requirements of the School of Computer Science for at least one of the B.C.S. program streams;
3. meet the minimum grade-point standards for Honours as stated below;
4. complete the program within seven calendar years of the entry to the course credit system;
5. be recommended by the School Council and the Faculty Board of the School of Computer Science.

To qualify for graduation with a Bachelor of Computer Science degree with Honours and Co-operative degree designations a student must:

1. present at least 22.0 approved credits beyond Qualifying-University year, including at least 15.0 credits at the 200-level or higher;
2. meet the program requirements of the School of Computer Science for at least one of the B.C.S. program streams;
3. meet the minimum grade-point standards for Honours as stated below;
4. complete the program within seven calendar years of the entry to the course credit system;

5. successfully complete a minimum of four work terms;
6. be recommended by the School Council and the Faculty Board of the School of Computer Science.

Designations of Honours Degrees

Three designations of Honours are awarded, determined on the basis of the GPA as follows:

Highest Honours

10.0 - 12.0 in Computer Science courses, and
8.0 or better overall

High Honours

9.0 or better in Computer Science courses, and
7.0 or better overall

Honours

6.5 or better in Computer Science courses, and
5.0 or better overall

Co-operative Degree Designation

Graduates successfully completing the requirements for graduation from the Co-operative Education Option will receive a Co-operative degree designation in addition to the Honours designation.

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Some of the following Computer Science courses are cross-listed from other parts of the Calendar. In every such case, only one course is actually offered and the two numbers are alternate identifiers for this single course. Students in the B.C.S. program should register in such a course under the Computer Science (95) number.

Note: In all courses with programming assignments, students usually find it necessary to be on campus at other than the scheduled lecture periods to make use of computing facilities.

Computer Science 95.101 ★

Introduction to Computers for the Arts and Social Sciences

This course is intended to give students in the arts and social sciences a working knowledge of computers and their applications; computer fundamentals; use of computing facilities; introduction to graphical user interfaces; a sampling of software packages applied to problems in the arts and social sciences.

Precludes additional credit for Computer Science 95.100 ★ and 95.104 ★. This course cannot be taken for credit by students in Business, Engineering, Computer Science, Mathematics or Science. Lectures three hours a week.

Computer Science 95.102 ★

Introduction to Systems Programming

A course designed to introduce the student to programming with procedures and primitive data types. Topics include: arrays, strings, pointers, heap and stack memory allocation and deallocation, iterative and recursive linked list manipulations, system/library calls. Programming experience in a high level language is highly recommended.

Precludes additional credit for Computer Science 95.107 ★ and Engineering 91.166 ★.

Lectures three hours a week.

Computer Science 95.104 ★

Introduction to Computers for the Sciences

This course provides students with a working knowledge of computers and their applications. Topics include computer fundamentals and the use of application packages such as text processors, spreadsheets, databases and web browsers with particular reference

to problems in Science.

Precludes additional credit for Computer Science 95.101 ★. This course cannot be taken for credit by students in the B.C.S. program or combined programs in Computer Science.

Lectures three hours a week.

Computer Science 95.105 ★

Introduction to Object-Oriented Programming

A first course in problem solving and computer programming designed for students who wish to specialize in Computer Science. Introduction to object-oriented programming: syntactic constructs, data abstraction, classification and inheritance, typing and polymorphism, testing and debugging.

Precludes additional credit for Engineering 91.166 ★.

Lectures three hours a week and one hour tutorial.

Computer Science 95.106 ★

Design and Implementation of Computer Applications

A continuation of Computer Science 95.105 ★ focusing on the design and implementation of complete applications including the user interface, the software architecture, and the interacting domain objects. Brief introduction to UML. Possible application topics include a testing framework, user-interface architectures and managing persistence.

Prerequisites: A grade of C- or better in either Computer Science 95.105 ★ or (with self-study of the programming language used) 95.108 ★.

Lectures three hours a week.

Computer Science 95.107 ★

Introduction to Structured Programming

A first course in computer programming, primarily for students in Science. Introduces basic sequencing, alternation, and looping control constructs, functional and procedural abstractions, data abstraction, and problem-solving in the context of computer programming.

Precludes additional credit for Engineering 91.166 ★ and Computer Science 95.102 ★ (if taken after 1996/97).

This course cannot be taken for credit by students currently registered in Computer Science programs.

Lectures three hours a week.

Computer Science 95.108 ★

Structured Programming Applications

A continuation of Computer Science 95.107 ★, primarily for students in Science. Designed to give students more experience at problem-solving using recursion, linked lists, trees, sorting and searching, and numerical techniques. This course cannot be taken for credit by students currently registered in Computer Science programs.

Prerequisites: Computer Science 95.107 ★ or (with self-study of the programming language used) 95.105 ★.

Lectures three hours a week.

Computer Science 95.185 ★

Discrete Structures I

An introduction to discrete mathematics and discrete structures. Topics include: propositional and predicate calculus, Boolean algebra, introduction to complexity of algorithms, mathematical reasoning, counting, recurrences, relations, introduction to graphs. (Also listed as Mathematics 69.185 ★.)

Prerequisites: Two OACs in Mathematics and one of Computer Science 95.105 ★ or 95.107 ★ (which may be taken concurrently).

Lectures three hours a week.

Computer Science 95.202 ★

Abstract Data Types and Algorithms

Introduction to the design and implementation of abstract data types and to the complexity analysis of data structures. Topics include: stacks, queues, lists, trees and graphs. Special attention is given to abstraction, interface specification and hierarchical design

through the use of an object-oriented programming language. Precludes additional credit for Engineering 94.202 ★.
 Prerequisites: A grade of C- or better in Computer Science 95.106 ★.
 Lectures three hours a week.

Computer Science 95.203 ★**Computer Organization**

A thorough treatment of computer system organization. Processor architectures (RISC, CISC, superscalar). Instruction sets and addressing modes. Assembly language. Basics of digital logic and hardware construction. Memory organization and cache principles. System buses. Input/output methods and devices.
 Precludes additional credit for Engineering 94.203 ★, 94.306 ★ for students in the Computer Science program and in combined programs with Mathematics or Chemistry.
 Prerequisite: Computer Science 95.102 ★ or Engineering 91.166 ★.
 Lectures three hours a week.

Computer Science 95.204 ★**Programming in C++**

In-depth study of the language C++ from a software engineering perspective, with emphasis on features supporting the development of large efficient and reusable systems. Topics include: encapsulation, templates, references, constructors and destructors, overloading, memory management, exception handling, standard template library, contracts and patterns, and configuration management.
 Precludes additional credit for Engineering 94.204 ★.
 Prerequisites: A grade of C- or better in either Computer Science 95.102 ★ or 95.107 ★, and a grade of C- or better in either 95.106 ★ or 95.108 ★.
 Lectures three hours a week.

Computer Science 95.205 ★**Internet Application Programming**

Design and implementation of Internet application programs. Topics include: fundamentals of the Web, introduction to client/server architectures, Internet programming, Web browsers, hypertext links, network programming.
 Prerequisites: Computer Science 95.106 ★ or equivalent.
 Lectures three hours a week.

Computer Science 95.285 ★**Discrete Structures II**

A second course in theoretical aspects of computer science. Topics include: formal languages and automata theory, computability theory, complexity theory, graph theory and algorithms, NP-completeness.
 Prerequisite: Computer Science 95.185 ★
 Lectures three hours a week.

Computer Science 95.300 ★**Operating Systems**

A first course in operating systems stressing fundamental issues in design: process management; memory management; process coordination and synchronization; interprocess communication; real-time clock management; i/o device drivers; file systems; frame-level network communication. Assignments involve the use, modification, and extension of a multitasking operating system.
 Precludes additional credit for Engineering 94.301 ★.
 Prerequisites: One of Computer Science 95.202 ★ or Engineering 94.202 ★, and one of Computer Science 95.203 ★ or Engineering 94.303 ★.
 Lectures three hours a week.

Computer Science 95.302 ★**Compiler Construction**

The structure, organization and design of the phases of a compiler are considered: lexical translators, syntactical translators, scope handlers, type checkers, code generators and optimizers. Components of a compiler will be implemented.

Prerequisite: Computer Science 95.202 ★ or permission of the School.

Lectures three hours a week.

Computer Science 95.304 ★**Software Systems Development**

Theory and practice at developing software systems. At the macro-level we discuss the three major steps: Plan and Elaborate, Build, Deploy. At the micro-level, we study iterative development: refine plan, synchronize artifacts, analyze, design, construct and test. We consider patterns and discuss UML in depth.
 Precludes additional credit for Engineering 94.310 ★ and 94.480 ★.
 Prerequisite: Computer Science 95.204 ★.
 Lectures three hours a week.

Computer Science 95.305 ★**Database Management Systems**

Introduces students to concepts of database management systems, database design and file structures. Topics include: entity-relationship modeling and object oriented database design, data models (relational, network and object oriented), the relational algebra, SQL, normalization theory, physical data organization, object oriented databases and OQL.
 Precludes additional credit for Business 42.340 ★ and Engineering 94.301 ★.
 Prerequisites: Computer Science 95.202 ★ and 95.204 ★, or Engineering 94.303 ★.
 Lectures three hours a week.

Computer Science 95.307 ★**Programming Paradigms**

An introduction to functional and logic programming. Topics include: semantics of functional programming, assignment-free programming, the meta-circular interpreter, recursive functions, Prolog, backtracking, cutting, negation.
 Precludes additional credit for Computer Science 95.207 ★.
 Prerequisite: Computer Science 95.202 ★ or Engineering 94.202 ★.
 Lectures three hours a week.

Computer Science 95.308 ★**User Interface Architectures**

This course addresses architectures and tools for the design and implementation of user-interfaces driven application. Emphasis will be on case studies using libraries and visual programming tools. Examples may be drawn from object-oriented programming environments, Motif and Tcl/Tk.
 Prerequisites: Computer Science 95.106 ★ and 95.204 ★.
 Lectures three hours a week.

Computer Science 95.314 ★**Foundations of Software Engineering**

Survey of the Software Engineering field. Possible topics include: processes, project management, requirements engineering, formal specifications, software design, user interface design, software reliability, reuse, computer-aided software engineering, configuration management, maintenance and re-engineering.
 Precludes additional credit for Engineering 94.480 ★.
 Prerequisite: Computer Science 95.304 ★.
 Lectures three hours a week.

Computer Science 95.320 ★**Co-operative Work Term Report 1**

Prerequisites: Registration in the Co-operative Education Option of the Bachelor of Computer Science program and permission of the School.

Computer Science 95.321 ★**Co-operative Work Term Report 2**

Prerequisites: Registration in the Co-operative Education Option of the Bachelor of Computer Science program and permission of the School.

Computer Science 95.322 ★

Co-operative Work Term Report 3

Prerequisites: Registration in the Co-operative Education Option of the Bachelor of Computer Science program and permission of the School.

Computer Science 95.323 ★

Principles of Computer Networks

This is an introductory course to the field of Network Computing. Topics include: Protocol Architectures and Internetworking, Types of Networks, Communication Protocols, End-System and Network Traffic Management, Structure of Routing and Congestion Control.

Precludes additional credit for Engineering 94.462 ★.

Prerequisites: Computer Science 95.205 ★ and 95.300 ★.

Lectures three hours a week.

Computer Science 95.384 ★

Design and Analysis of Algorithms I

An introduction to the design and analysis of algorithms. Topics include: recurrence relations, sorting and searching, divide-and-conquer, dynamic programming, greedy algorithms, amortized analysis. (Also listed as Mathematics 69.384 ★.)

Prerequisites: Computer Science 95.202 ★ and either 95.285 ★ or both of Mathematics 69.207 ★ and 69.218 ★ or equivalents.

Lectures three hours a week.

Computer Science 95.385 ★

Discrete Structures and Applications

Enumeration: elementary methods, inclusion and exclusion, recurrence relations, generating functions and applications. Graph theory and algorithms: connectivity, planarity, Hamilton and Euler paths. Error-correcting codes. (Also listed as Mathematics 70.385 ★.)

Prerequisites: One of Mathematics 69.218 ★ or 69.311 ★, 70.210.

Lectures three hours a week and one hour tutorial.

Computer Science 95.386 ★

Numerical Analysis

Elementary discussion of error, polynomial interpolation, quadrature, linear systems of equations and matrix inversion, non-linear equations, difference equations and ordinary differential equations. (Also listed as Mathematics 69.386 ★.)

Prerequisites: (i) Mathematics 69.102, 69.105 or 69.207 ★ (or 69.201 or 69.202); and (ii) Mathematics 69.112 or 69.217 ★; and (iii) knowledge of a computer language.

Lectures three hours a week and one hour tutorial.

Computer Science 95.387 ★

Mathematical Software

Incorporation of basic numerical methods into efficient, reliable software. The course includes examination of existing software systems, e.g. linear systems, non-linear systems, optimization, or differential equations. (Also listed as Mathematics 69.387 ★.)

Prerequisite: Computer Science 95.386 ★.

Computer Science 95.400 ★

Distributed Operating Systems

An advanced course emphasizing the principles of distributed operating systems including networking protocols, distributed file systems, remote IPC mechanisms, graphical user interfaces, load balancing, and process migration. Case studies include current "standards" as well as novel systems under development.

Prerequisite: Computer Science 95.300 ★.

Lectures three hours a week.

Computer Science 95.401 ★

Distributed Computing

Overview of distributed computing. Topics include: computational

models, communication complexity, design and analysis of distributed algorithms and protocols, fault-tolerant protocols, synchronous computations. Applications may include: communication in data networks, control in distributed system (e.g., election, distributed mutual exclusion), manipulation of distributed data (e.g., ranking).

Prerequisite: Computer Science 95.300 ★.

Lectures three hours a week.

Computer Science 95.402 ★

Computer Graphics

Principles and techniques of real-time 2D and 3D graphics: raster graphics algorithms, transformations (scaling, translation, rotations) and viewing, object modeling, texture mapped rendering, illumination, ray-tracing, hidden line and surface elimination. Other possible topics include: camera control, collision detection, articulated figures, 3D game engine development.

Prerequisite: Computer Science 95.202 ★ or permission of the School.

Lectures three hours a week.

Computer Science 95.403 ★

Transaction Processing Systems

Investigates concepts of on-line transaction processing. Traces transaction processes from their initiation (WWW Interfaces) to their completions in client/server environments under concurrent executions and system failures. Topics include: transaction properties and models, embedded-SQL and database applications, query processing, concurrency, recovery, and some case studies.

Prerequisites: Computer Science 95.204 ★, and 95.305 ★ or Engineering 94.301 ★.

Lectures three hours a week.

Computer Science 95.404 ★

Software Quality Assurance

Introduction to the theory and practice of Software Quality Assurance. Topics include: functional requirements analysis, system requirement analysis, verification and validation, traceability, white box testing, integration testing, object-oriented testing, tools, and management issues.

Prerequisite: Computer Science 95.314 ★.

Lectures three hours a week.

Computer Science 95.407 ★

Applied Artificial Intelligence

A course emphasizing artificial intelligence techniques and programming. Sample topics include: knowledge-based systems, knowledge representation, heuristic search, natural language processing, symbolic machine learning, connectionism, evolutionary computation.

Prerequisite: Computer Science 95.307 ★.

Lectures three hours a week.

Computer Science 95.409 ★

Introduction to Parallel and Systolic Computing

Introduction to algorithms, architectures, and languages for parallel computing. Topics include: models of computation, parallel programming languages, performance measures for parallel algorithms, shared memory parallel machines, VLSI design methodologies, processor arrays, hypercube multiprocessors, parallel algebraic operations, parallel data structures and parallel searching, parallel geometric processing.

Prerequisite: Computer Science 95.384 ★.

Lectures three hours a week.

Computer Science 95.410 ★

Multimedia Systems

Introduction to Multimedia Systems and Virtual Reality. Topics include: basic sound and video formats, compression, image- and

geometry-based model creation, stereo displays, immersion, texture mapping, VRML and virtual environments.

Prerequisite: Computer Science 95.402 ★.

Lectures three hours a week.

Computer Science 95.411 ★

Distributed Object Management and Transaction Processing Systems.

Study of the principles involved in the design and implementation of distributed object management, CORBA-based transaction services and distributed object-based applications. Topics include: Distributed Object Management Architectures, Transactional Middleware, Combining Java, Web and CORBA Objects within Heterogeneous Systems, Interoperability, Security, Scalability and Performance Measures.

Prerequisite: Computer Science 95.305 ★ and either 95.403 ★ or 95.401 ★ or equivalents. (Knowledge of C/C++ and Java is essential).

Lectures three hours a week.

Computer Science 95.413 ★

Computer Security and Cryptography

Introduction to information security in computer and communication systems. Classical and public-key cryptosystems are overviewed. Applications to information schemes and digital signatures, key distribution and key agreement, authentication and secret sharing are also discussed. Also offered at the graduate level, with additional or different requirements, as Computer Science 95.513 ★, for which additional credit is precluded.

Prerequisite: Computer Science 95.384 ★.

Lectures three hours a week.

Computer Science 95.414 ★

Object-Oriented Software Engineering

An in-depth look at the field of Object-Oriented Software Engineering. Possible topics include: patterns (architectural, design, distribution, user interface, process, analysis and general-purpose), traceability and object-oriented quality engineering, CASE tools, software agents and their enabling technologies (such as JAVA and CORBA), object-oriented persistence, reflective architectures.

Prerequisites: Computer Science 95.106 ★ and 95.304 ★.

Lectures three hours a week.

Computer Science 95.420 ★

Co-operative Work Term Report 4

Prerequisites: Registration in the Co-operative Education Option of the Bachelor of Computer Science program and permission of the School.

Computer Science 95.421 ★

Co-operative Work Term Report 5

Prerequisites: Registration in the Co-operative Education Option of the Bachelor of Computer Science program and permission of the School.

Computer Science 95.483 ★

Computable Functions

Recursive functions and computability, algorithms, Church's thesis, Turing machines, computational logic, NP-completeness. (Also listed as Mathematics 70.483 ★.)

Prerequisite: Mathematics 70.210 or Computer Science 95.385 ★ or permission of the School.

Computer Science 95.484 ★

Design and Analysis of Algorithms II

A second course on the design and analysis of algorithms. Topics include: advanced recurrence relations, algebraic complexity, advanced graph algorithms, approximation algorithms, randomized algorithms. Also offered at the graduate level, with additional or different requirements, as Computer Science 95.573, for which additional credit is precluded.

Prerequisite: Computer Science 95.384 ★ or permission of the School.

Lectures three hours a week.

Computer Science 95.485 ★

Theory of Automata

Finite automata and regular expressions, properties of regular sets, context-free grammars, pushdown automata, deterministic context-free languages. Turing machines, the Chomsky hierarchy. Undecidability, intractable problems. (Also listed as Mathematics 70.485 ★.)

Precludes additional credit for Mathematics 70.565

Prerequisite: Computer Science 95.385 ★ or Mathematics 70.310 or permission of the School.

Lectures three hours a week.

Computer Science 95.486 ★

Numerical Linear Algebra

Study of matrix inversion techniques; techniques of finding eigenvalues and eigenvectors, solution of systems of linear equations; direct and indirect methods, their comparison and error analysis; applications in optimization and other areas. (Also listed as Mathematics 70.486 ★.)

Prerequisites: Mathematics 69.112 or 69.217 ★; and Mathematics 70.200 or 69.309 ★, or permission of the School.

Lectures three hours a week.

Computer Science 95.490 ★

Advanced Topics in Computer Science

Selected topics in Computer Science offered by members of the School of Computer Science.

Prerequisite: Permission of the School.

Lectures three hours a week.

Computer Science 95.491 ★

Directed Studies

A course of independent study under the supervision of a member of the School of Computer Science, open only to students in the B.C.S. program. Students are required to obtain their supervisor's written approval prior to registration and are limited to two such courses in their programs.

Prerequisite: Permission of the School of Computer Science.

Computer Science 95.495 ★

Honours Project

As part of the Fourth-year program, each B.C.S. student is required to select and complete a major project in computer science. Students are required to submit written project proposals to the Honours Project Co-ordinator for approval normally during the term preceding the term of registration. Consult the Honours Project Co-ordinator for details.

Prerequisite: Registration in either the Bachelor of Computer Science program or one of the Combined Honours programs involving Computer Science and the permission of the School.

Other Relevant Courses Offered

The following courses are not offered by the School of Computer Science but are relevant to the study of computer science. They may be taken for credit as computer science courses in the B.C.S. Program and the combined programs with Computer Science. For full descriptions of these courses please refer to the Calendar entries of the School of Business and the Department of Systems and Computer Engineering.

Courses Offered by the School of Business

Business 42.230 ★, 42.240 ★, 42.440 ★, 42.442 ★, 42.446 ★, 42.447 ★

Courses Offered by the Faculty of Engineering

Engineering 94.333 ★, 94.405 ★, 94.457 ★

Criminology and Criminal Justice (Public Affairs and Management)

Telephone: 520-2588
Fax: 520-6654

Academic Administration

Program Co-ordinator, Katharine Kelly
Administrative Assistant, Sandra Rochon

Placement Supervisor, Cheryl Stout

Members of the Program Committee

Adelle Forth (Psychology) • Tullio Caputo (Sociology) • Renate Mohr (Law)

General Information

Through the Interdepartmental Institute of Criminology and Criminal Justice, programs of study leading to the B.A. and B.A. (Honours) degrees in Criminology and Criminal Justice are available to students interested in a comprehensive and interdisciplinary approach to the study of Criminology and Criminal Justice. Students will acquire an in-depth understanding of criminal, delinquent, and deviant behaviour, theoretical and practical knowledge of criminal law and the criminal justice system, and societal reaction to crime and deviance. In these programs, students take courses from the three disciplines of Law, Psychology and Sociology that provide the topics and approaches needed to gain insight into the field of criminology while also completing a Concentration in one of these disciplines. Students accepted into the Major will have the opportunity to acquire applied knowledge by undertaking a field placement in an agency active in criminal justice.

Admission Requirements

See the guidelines for B.A. (Honours) and B.A. programs on p. 41.

Graduation Regulations

To be eligible to graduate, students must fulfill all University graduation regulations (see p. 48), all Faculty regulations (see p. 74), and all Major regulations and requirements set out below. The B.A. requirement for Breadth is modified for students in this Major. Students in the B.A. program must present 1.0 credit in either area 1 or 2 while students in the B.A. (Honours) program must present 2.0 credits (1.0 in each of area 1 or 2, or 2.0 credits from either area). See p. 63.

B.A. in Criminology and Criminal Justice with a Concentration in Law, Psychology or Sociology

The Major requirements are:

1. 8.0 required credits in the Major:

Criminology 48.391 or 1.0 credit in elective courses in the Major at the 300-level (see below); and

Law 51.100 and 51.204 and either 51.335 ★ or 51.336 ★; and

Psychology 49.101 ★ and 49.102 ★ and 49.240 ★ and 49.342 ★; and

Sociology 53.100 or Anthropology 54.100 or Sociology/Anthropology 56.100 and 53.255 ★ and 53.271 ★ and either 53.373 ★ or 53.388 ★.

2. Concentration credits. Students must declare a Concentration at the Registrarial Services Office prior to registration in their second

year of study. Students must choose one of the three following patterns from the contributing disciplines (note that each pattern incorporates courses required under 1, above):

Law: 51.100, 51.204, 51.335 ★ or 51.336 ★

2.0 further credits in Law at the 200-level or higher.

Psychology: 49.101 ★ and 49.102 ★, 49.200, 49.240 ★, 49.342 ★

1.5 further credits in Psychology at the 200-level or higher.

Sociology: 53.100 or 54.100 or 56.100 53.203, 53.255 ★, 53.271 ★, 53.373 ★ or 53.388 ★

1.0 further credits in Sociology at the 200-level or higher.

Note: The total number of courses in the Major and in the Concentration may not exceed 11.5 credits.

B.A. (Honours) in Criminology and Criminal Justice with a Concentration in Law, Psychology or Sociology

The Major requirements are:

1. 10.0 required credits in the Major:

Criminology 48.300 or 1.0 additional credit in elective courses in the Major at the 300-level or higher. (Note: Sociology 53.370 may be substituted for 48.300 for students doing their concentration and/or Honours Research Project in Sociology.)

Criminology 48.391 (or 1.0 credit in elective courses in the Major at the 300-level); and

Criminology 48.498 (or 1.0 credit in elective courses in the Major at the 400-level) and

Law 51.100 and 51.204 and either 51.335 ★ or 51.336 ★; and

Psychology 49.101 ★ and 49.102 ★ and 49.240 ★ and 49.342 ★; and

Sociology 53.100 or Anthropology 54.100 or Sociology/Anthropology 56.100 and 53.255 ★ and 53.271 ★ and either 53.373 ★ or 53.388 ★.

2. Concentration Credits: Students must declare a Concentration at the Registrarial Services Office prior to registration in their second year of study. Students must choose one of the following patterns of required Concentration credits in the contributing disciplines (note that each pattern incorporates courses required under 1, above):

Law: 51.100, 51.204, 51.335 ★ or 51.336 ★, 51.397 ★

1.0 further credits in Law at the 200-level or higher

1.5 further credits in Law at the 300-level or higher.

Psychology: 49.101 ★ and 49.102 ★, 49.200, 49.240 ★, 49.342 ★, 49.300

1.0 further credits in Psychology at the 200-level or higher

0.5 further credits in Psychology at the 300-level or higher.

Sociology: 53.100 or 54.100 or 56.100

53.203, 53.255 ★, 53.271 ★, 53.373 ★ or 53.388 ★

1.0 further credit in Sociology at the 200-level or higher

1.0 further credit in Sociology at the 300-level or higher
(56.205 or 53.406 are highly recommended).

Elective credits in the Criminology and Criminal Justice Major may be chosen from the following list of courses:

Criminology 48.392;

Law 51.337 ★; 51.432 ★; 51.435 ★; 51.436 ★; 51.437 ★; 51.438 ★;
51.439 ★; 51.454 ★; 51.490; 51.491 ★; 51.492 ★

Psychology 49.210 ★; 49.260 ★; 49.343 ★; 49.357 ★; 49.364 ★;
49.490 ★; 49.492 ★

Sociology 53.256 ★; 53.453 ★; 53.474 ★; 53.491 ★; 53.492 ★

Note: The total number of courses in the Major and in the Concentration may not exceed 15.0 credits.

Prerequisites:

Courses in the Major at the 200-level or higher have specific prerequisites which must be met.

Registration in Criminology 48.300 is limited to students eligible for Third-year or higher standing in the B.A. (Honours) program in Criminology and Criminal Justice.

Registration in Criminology 48.498 (Honours Research Project) is available only to students with Fourth-year standing in the B.A. (Honours) program in Criminology and Criminal Justice who have a G.P.A. of 10.0 or better.

Topics studied in Criminology 48.498, Psychology 49.490 ★, 49.492 ★, Law 51.490, 51.491 ★, 51.492 ★, Sociology 53.491 ★ and 53.492 ★ must pertain to the legal, psychological or sociological analysis of crime or criminal justice and must be approved by the Coordinator.

Students may request permission to offer courses towards the Major which are not listed as electives, including those offered by the Criminal Justice and Social Policy Summer School as well as special topics courses offered from time to time by the Institute. Students should consult the Coordinator for a listing of courses approved as alternative electives.

Field Placement Option

The Field Placement is offered at the 300-level. Students complete a 1.0 credit Field Placement during the Fall/Winter session. Enrolment in Fall/Winter session will be limited to not more than 80 students who have completed at least 9.0 credits, including all of the 100- and 200-level requirements in the Major. A floating cutoff will be used to identify the students with the highest G.P.A. over those required courses, who may then receive permission to register for the Field Placement. Allocation of Field Placements will be determined by the Field Placement Coordinator.

Students wishing to register for a Field Placement must apply to the Institute no later than May 1 of their Second year. If granted

permission, students must register in Criminology 48.391 during August registration. Students in the B.A. (Honours) program may receive permission to complete a 2.0 credit placement, in which case they must also register in Criminology 48.392.

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Criminology 48.300

Honours Seminar in Criminology

Issues and research methodologies in the study of crime. Emphasis is on a critical evaluation of literature and methods used across disciplines. Topics of professional interest, including ethics, are also considered. Students may be required to complete independent research projects.

Prerequisites: Third-year standing in the B.A. (Honours) program in Criminology and Criminal Justice and permission of the Institute. Lectures and seminar three hours a week, laboratory one hour a week.

Criminology 48.391

Practicum in Criminology and Criminal Justice I

Through a field placement in an agency setting, students are provided the opportunity to obtain practical involvement in various aspects of criminal justice. Discussion and presentations in the Seminar Class and required term papers integrate applied, theoretical and empirical knowledge.

Precludes additional credit for Law 51.395 ★, Psychology 49.393 ★, 49.394 ★, and Sociology 53.386 ★.

Prerequisites: Third-year standing in Criminology and Criminal Justice and permission of the Institute.

Field placement eight hours a week, seminar three hours a week.

Criminology 48.392

Practicum in Criminology and Criminal Justice II

Through a field placement in an agency setting, students are provided the opportunity to obtain practical involvement in various aspects of criminal justice. Discussion and presentations in the Seminar Class and required term papers integrate applied, theoretical and empirical knowledge.

Precludes additional credit for Law 51.395 ★, Psychology 49.393 ★, 49.394 ★, and Sociology 53.386 ★.

Prerequisites: Third-year Honours standing in Criminology and Criminal Justice and permission of the Institute.

Field placement eight hours a week, seminar three hours a week.

Criminology 48.498

Honours Research Project

A research project conducted under the direct supervision of a Faculty Advisor from Psychology, Law or Sociology. Mandatory workshops and symposiums are scheduled during the year.

Prerequisite: Criminology 48.300 and Fourth-year standing in the B.A. (Honours) program in Criminology and Criminal Justice with a GPA of 10.0 or better in the Major and permission of the Institute. Workshops and symposiums as scheduled.

Directed Interdisciplinary Studies (Arts and Social Sciences)

2216 Dunton Tower
Telephone: 520-2368

Academic Administration

Program Co-ordinator, Charles Gordon

Members of the Committee

Fran Cherry • David Dean • Andrea Doucet • Laura Marks •
Denise McKenna • Edward Osei Kwadwo Prempeh • Rob Shields
• Shelagh Squire • John Taylor • Karen Warner

General Information

The degree of Bachelor of Arts in Interdisciplinary Studies is pursued by means of a plan of study proposed by the student. Lists of courses from which proposals may be drawn are provided in the following areas: Aboriginal Studies, African Studies, Asian Studies, Labour Studies, Latin American and Caribbean Studies, Medieval Studies, United States Studies and Urban Studies. (For Visual and Performing Arts, see the listings for the School for Studies in Art and Culture, p. 130. For Technology, Society, Environment Studies, see p. 463). The student may propose a plan of study in an area of special interest to them that they define themselves.

The program is administered by the Institute of Interdisciplinary Studies (see p. 300 for the Institute's general listing).

Graduation Regulations

In order to graduate, students must fulfill all University graduation regulations (see p. 48), all Faculty regulations including those relating to First-Year Seminars (see p. 63), and all Committee regulations and requirements set out below.

B.A. (Honours) Program

Students applying for the B.A. (Honours) program in Directed Interdisciplinary Studies must complete the prescribed application form, available from the Institute of Interdisciplinary Studies office. They are required to list 4.5 credits which meet the requirements listed in **Part A** below, and 9.5 credits which meet the requirements listed in **Part B** below, along with honours essay (04.498). The credits in **Part B** must be related to a significant theme or field of interest and fit into a coherent pattern. It is expected that the credits of **Part A** will be related to that theme as well. On acceptance of the proposed pattern of study, the credits described above, or variations agreed to by the Committee, become a requirement for completion of the degree.

Part A

1. 1.0 credit that addresses the temporal dimension of human societies, analyzing times before the current era, and societies other than our own.
2. 1.0 credit that addresses the artifacts of the imagination, in literature and other forms, that addresses the life of the imagination and the culture.
3. 1.0 credit that addresses the understanding of social and/or natural processes, and the ways in which that understanding is obtained in science and social science.
4. 1.0 credit that addresses matters of human values, ethics and social responsibilities.
5. Interdisciplinary Studies 04.391 ★.

Lists of appropriate courses to meet these requirements will be provided.

Part B

9.5 credits as proposed by the student and approved by the committee including:

1. 04.498 Honours Essay.
2. At least 4.0 credits in one discipline.
3. At least 3.0 credits at the 400-level or above.

B.A. Program

Students applying for the B.A. program in Directed Interdisciplinary Studies must complete the prescribed application form, which is available from the Institute of Interdisciplinary Studies office. They are required to list 4.5 credits which meet the requirements listed in **Part A** below, and 5.5 credits which meet the requirements listed in **Part B** below. The credits in **Part B** must be related to a significant theme or field of interest and fit into a coherent pattern. It is expected that the credits of **Part A** will be related to that theme as well. On acceptance of the proposed pattern of study, the credits described above, or variations agreed to by the Committee, become a requirement for completion of the degree.

Part A

1. 1.0 credit that addresses the temporal dimension of human societies, analyzing times before the current era, and societies other than our own.
2. 1.0 credit that addresses the artifacts of the imagination, in literature and other forms, or that addresses the life of the imagination and the culture.
3. 1.0 credit that addresses the understanding of social and/or natural processes, and the ways in which that understanding is obtained in science and social science.
4. 1.0 credit that addresses matters of human values, ethics and social responsibilities.
5. Interdisciplinary Studies 04.391 ★.

Lists of appropriate courses to meet these requirements will be provided.

Part B

1. 5.5 credits as proposed by the student and approved by the committee.
2. At least one of these credits must be at the 300-level.

B.A. (Honours) and B.A.

1. Prior to submitting a formal application, students are advised to consult with the Program Co-ordinator for assistance in working out a suitable pattern of courses.

2. To allow time for adequate appraisal by the Committee, the proposal should be submitted as early as possible before the year of entry to the program (by June 1 for September registration and by November 1 for January registration).

3. Students may apply for admission to the program at any time after completion of their first 5.0 credits and before they begin their last 5.0 credits towards the degree.

4. Normally, 3.0 credits in the student's field of interest are to be included among the last 5.0 credits taken towards the degree.

5. In order to graduate, students must have an overall GPA of 4.0 or better in all 15.0 credits counted towards the degree, as well as a GPA of 4.0 or better in the 10.0 credit pattern approved for the degree.

Interdisciplinary Subject Areas

The Institute of Interdisciplinary Studies sponsors the interdisciplinary subject areas described below. There are no majors in these areas but there is strong teaching and active research interest. Students interested in pursuing work in any of these areas either through the Directed Interdisciplinary Studies major or in conjunction with a disciplinary major should arrange a meeting with the area co-ordinator. Where a co-ordinator is not named, contact the office of the Institute of Interdisciplinary Studies.

In all cases detailed descriptions of the courses listed for each area can be found in the various departmental courses listings. Courses at the 500-level are described in the Calendar of the Faculty of Graduate Studies and Research.

Aboriginal Studies

Co-ordinator: Armand Garnet Ruffo

Individual departments at Carleton offer courses concerned with aboriginal issues. Growing interest in Canadian first peoples has promoted a gradual increase in courses about aboriginal cultures and an increase in related activities on campus. No degree program in aboriginal studies exists, but students may submit a coherent pattern of courses selected from the list below for a B.A. (Honours) or B.A. degree in Directed Interdisciplinary Studies, according to the procedures described for this degree in the Calendar. See p. 207.

Courses

Applied Language Studies
23.190, 23.195

Art History
11.205★, 11.206★, 11.313★, 11.314★, 11.404★, 11.405★, 11.502★, 11.507★

Canadian Studies
12.510

English
18.488★

Geography
45.351★, 45.431★, 45.570★

History
24.353

Law
51.354★, 51.436★

Music
30.230★, 30.310, 30.512★

Political Science
47.402★

Sociology and Anthropology
54.207★, 54.318★, 54.319★, 54.470★, 54.516★, 54.517★, 56.234★, 56.307★, 56.420★, 56.465★

Other

Art History, Canadian Studies, English, Law, Linguistics and Applied Language Studies, and Sociology/Anthropology have special topics courses which, from year to year, may focus on aboriginal issues.

African Studies

Co-ordinator: Edward Osei Kwadwo Prempeh

The Committee on African Studies, an informal committee of faculty with teaching and research interest in Africa, coordinates activities in this area. African Studies is one of the earliest and strongest area studies programs, with courses offered in various departments and schools. Students can select these courses as part of their degree program.

Students may also submit a pattern of courses of African Studies for a B.A. (Honours) or B.A. degree (Directed Interdisciplinary Studies) according to the procedures described for this degree in the Calendar. (see p. 207)

Courses

Applied Language Studies
23.130

Art History
11.313★

Comparative Literary Studies
17.208★

Economics
43.363★, 43.457★, 43.458★

English
18.496★

Geography
45.329★, 45.330★, 45.395★, 45.520★, 45.540★, 45.544★

History
24.275

International Affairs
46.529★, 46.533★, 46.537★, 46.542★, 46.563★, 46.568★, 46.581★

Law
51.563★

Music
30.208★, 30.231★, 30.251★

Political Science
47.309★, 47.310★, 47.344★, 47.352★, 47.414★, 47.415★, 47.423★, 47.482★, 47.517★, 47.522★, 47.523★, 47.545★, 47.581★

Public Administration
50.573★

Sociology and Anthropology
56.361★, 53.544★

Asian Studies

Co-ordinator: P.J. Davidson

No degree program for Asian studies exists but members of the Committee for Asian Studies offer a wide variety of courses about Asia. Research activities are encouraged through such units as the Asian Pacific Research and Resource Centre. The University is a member of the Shastri Indo-Canadian Institute. The Norman Paterson School of International Affairs supports graduate studies and research on Asia. Students may submit a coherent pattern of courses selected from the list below for a B.A. (Honours) or B.A. degree (Directed Interdisciplinary Studies), according to the procedures described for this degree in the Calendar. (see p. 207)

Courses*Applied Language Studies*

23.110, 23.115, 23.120, 23.125, 23.130, 23.140, 23.150, 23.160

Business

42.463 ★

Comparative Literary Studies

17.207 ★

Economics

43.457 ★, 43.458 ★, 43.487 ★, 43.555 ★

Geography

45.540 ★

History

24.170, 24.278, 24.285, 24.286, 24.385 ★, 24.386 ★, 24.485

International Affairs

46.508, 46.527 ★, 46.557, 46.560, 46.561 ★, 46.567 ★, 46.569, 46.580 ★

Music

30.209 ★

Political Science

47.312, 47.315, 47.332 ★, 47.483 ★, 47.484 ★, 47.518 ★

Religion

34.105 ★, 34.106 ★, 34.109 ★, 34.278, 34.320 ★, 34.342 ★

Labour Studies*Co-ordinator:* To be announced

The Committee on Labour Studies, consisting of faculty members with research and teaching interests in labour, acts as a co-ordinating unit for activities in this area. An interdisciplinary Labour Studies Research and Resource Centre has been established for use by the University community and the public at large. The University offers a wide range of courses in the humanities and social sciences relating to labour, and students can select those courses as part of their degree program.

Students may also submit a coherent pattern of courses in Labour Studies for a B.A. (Honours) or B.A. degree (Directed Interdisciplinary Studies). Assistance in planning such a pattern is available from the co-ordinator.

Courses

In developing a pattern in Labour Studies, the student can choose from the following suggested basic and related courses.

Basic Courses*Business*

42.312 ★, 42.317 ★

Economics

43.356 ★, 43.357 ★, 43.436 ★, 43.465

History

24.222, 24.331 ★, 24.335, 24.439

Law

51.341 ★, 51.345 ★, 51.440 ★, 51.445 ★

Philosophy

32.220, 32.284 ★, 32.330

Political Science

47.306 ★, 47.412 ★, 47.413 ★, 47.416 ★, 47.431 ★, 47.432 ★

Sociology/Anthropology

53.257 ★, 53.258 ★, 53.346 ★, 53.348 ★, 53.381 ★, 56.344 ★, 56.458 ★

Related Courses*Business*

42.311 ★, 42.413 ★

Economics

43.325, 43.344 ★

History

24.234, 24.235, 24.270, 24.325 ★, 24.329 ★, 24.330 ★, 24.332, 24.337, 24.370, 24.433, 24.458

Law

51.203, 51.205, 51.301, 51.321 ★, 51.353

Philosophy

32.202, 32.409

Political Science

47.200, 47.335 ★, 47.345 ★, 47.400A

Sociology

53.247, 54.333 ★, 53.345 ★, 53.347 ★, 53.433 ★, (Law 51.417 ★), 53.452 ★

Other courses in specific disciplines may be applicable; students should consult advisers in these disciplines.

Latin American and Caribbean Studies*Co-ordinator:* To be announced

At present, no degree program in Latin American and Caribbean Studies exists at Carleton. It is possible, however, for students to construct a program for a B.A. (Honours) or B.A. degree (Directed Interdisciplinary Studies) that could focus on the Latin American and Caribbean region. (See p. 207 for the prescribed procedures for this degree.)

Of particular interest to some students may be a B.A. (Honours) or B.A. degree in French with supporting work in one or more of the Social Sciences, or a Social Science program with supporting work in French. The same combinations would be possible for those students interested in English and the English Speaking Caribbean.

Courses with a Latin American and Caribbean content are listed below. Detailed course descriptions may be found in the departmental listings of this Calendar. Graduate level courses are described in the Calendar of Graduate Studies and Research.

Knowledge of languages is indispensable for the study of the region. The language courses relevant for Latin America are described under the listings of Spanish and French in this Calendar.

Courses*Economics*

43.363 ★, 43.457 ★, 43.458 ★

English

18.496

Film Studies

19.421 ★

French

20.470 ★, 20.471 ★

Geography

45.220 ★, 45.329 ★

History

24.236, 24.237, 24.371 ★, 24.375 ★, 24.376 ★, 24.471

International Affairs

46.533, 46.561, 46.564, 46.568, 46.581

Music

23.230 ★

Political Science

47.215, 47.260, 47.311, 47.318 ★, 47.414 ★, 47.415 ★

Public Administration

50.515, 50.517, 50.567

Directed Interdisciplinary Studies

Social Work
52.519

Sociology and Anthropology
54.318 ★, 54.333 ★, 53.360, 56.330 ★, 56.465 ★

Medieval Studies

Co-ordinator: D. le Berrurier

The University offers a wide range of courses in the humanities and social sciences relating to the Middle Ages, and students can select these courses as part of their degree program.

Students may also submit a coherent pattern of courses in Medieval Studies for a B.A. (Honours) or B.A. degree (Directed Interdisciplinary Studies), in accordance with the procedures described for this degree in the Calendar, p.207. Contact the Co-ordinator for assistance in planning a program.

Courses

Art History
11.220 ★, 11.221 ★, 11.325 ★, 11.327 ★, 11.328 ★, 11.393 ★, 11.422 ★, 11.423 ★

Classics
13.302, 13.303, 13.402

This Department offers several courses in Greek and Latin. Medieval Latin may be taken on a tutorial basis.

English
18.312, 18.322, 18.428 ★, 18.492 ★

French
20.261 ★

German
22.430

History
24.205, 24.302, 24.303, 24.306 ★, 24.307 ★, 24.402, 24.405, 24.406

Italian
26.351 ★, 26.356 ★

Music
30.200 ★, 30.430 ★

Philosophy
32.225, 32.473 ★, 32.474 ★

Political Science
47.334

Spanish
38.415 ★, 38.416 ★

United States Studies

Co-ordinator: To be announced

No degree program in United States Studies exists, but students may utilize the considerable number of relevant courses already offered at Carleton to develop a relevant plan of study in this area. The aim of the United States Studies concentration within Directed Interdisciplinary Studies is to introduce students to a broad and systematic study of the United States and its peoples; to give a broad understanding of their history, culture and society and to study the relationships between these various aspects of American experience.

Courses

Art History
11.305 ★, 11.306 ★, 11.406 ★

Economics
43.305 ★, 43.426 ★

English
18.272, 18.371, 18.373, 18.471 ★, 18.478 ★, 18.479 ★

Film Studies
19.100, 19.325

History
24.236, 24.240, 24.334 ★, 24.341 ★, 24.342 ★, 24.344, 24.346 ★, 24.347 ★, 24.348, 24.349, 24.440, 24.442, 24.443, 24.491

Interdisciplinary
04.441 ★

Music
30.205 ★, 30.206 ★, 30.207 ★, 30.312 ★

Political Science
47.100, 47.322, 47.420 ★, 47.421 ★, 47.466 ★

Sociology and Anthropology
56.100, 53.100

Urban Studies

Co-ordinator: Charles Gordon

The Interfaculty Committee on Urban Studies has drawn up the following list of undergraduate courses in urban studies currently offered at Carleton.

Students may submit a coherent pattern of courses in urban studies for a B.A. Honours or B.A. degree (Directed Interdisciplinary Studies) in accordance with the procedures described for this degree in the Calendar, p. 207. Assistance in planning such a program is available from members of the Committee on Urban Studies.

Courses

Architecture
76.308 ★, 76.315 ★, 76.328 ★, 76.423 ★ (see Sociology 53.339 ★), 76.424 ★ (see Sociology 53.424 ★), 78.323 ★, 78.340 ★, 78.345 ★, 78.349 ★

Art History
11.302 ★, 11.305 ★, 11.350 ★

Economics
43.480

Engineering
82.334 ★, 82.433 ★, 82.435 ★

Geography
45.220 ★, 45.320 ★, 45.336 ★, 45.423 ★, 45.427 ★, 45.433 ★, 45.442 ★

Earth Sciences
67.417 ★

History
24.329 ★, 24.330 ★

Law
51.374 ★

Physics
75.291 ★, 75.292 ★

Political Science
47.302 ★, 47.303 ★, 47.410 ★

Sociology and Anthropology
53.254 ★, 53.260 ★, 56.312 ★, 56.339 ★, 53.424 ★, 56.456 ★

Visual and Performing Arts

For this area of study please consult the School for Studies in Art and Culture. (see p. 130)

Technology, Society, Environment

For this area of study please see p. 463.

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Interdisciplinary 04.391 ★

Themes in Interdisciplinary Inquiry

The course will examine topics chosen by the interdisciplinary faculty, along with various methods of inquiry and styles of thought that may be brought to bear upon them. Student reading and research will compare, contrast and synthesize various perspectives. Prerequisite: Third-year standing in Directed Interdisciplinary Studies, or permission of the Institute. Seminar three hours a week.

Interdisciplinary 04.441 ★

A Seminar in United States Studies

A required course for students in United States Studies area in Directed Interdisciplinary Studies designed to allow discussion and research on topics of an interdisciplinary nature.

Interdisciplinary 04.495 ★

Directed Interdisciplinary Studies Fieldwork I

Fieldwork related to the theme of a Directed Interdisciplinary Studies program. A proposal with a fieldwork research question and a supervisor must be approved prior to registration. A paper relating the fieldwork to the student's DIS program must be submitted. Graded as *Sat/Uns*.

For Directed Interdisciplinary Studies students only with 4th year Honours standing or permission of the Institute of Interdisciplinary Studies.

Interdisciplinary 04.496 ★

Directed Interdisciplinary Studies Fieldwork II

Fieldwork related to the theme of a Directed Interdisciplinary Studies program. A proposal with a fieldwork research question and a supervisor must be approved prior to registration. A paper relating the fieldwork to the student's DIS program must be submitted. Graded as *Sat/Uns*.

For Directed Interdisciplinary Studies students only with 4th year Honours standing or permission of the Institute of Interdisciplinary Studies.

Interdisciplinary 04.498

Honours Project

Interdisciplinary research project for Honours students in the Fourth year of all IIS programs. In selecting a project, students must consult their Program Coordinator. Only the Program Coordinator can assign a supervisor or grant approval to register in this course. Faculty regulations governing Honours Research Essays and Honours Thesis apply (see p. 67).

Registration in this course is limited to students in the Fourth year of a B.A. (Honours) program in IIS.

Earth Sciences (Science)

2240 Herzberg Building
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Academic Administration

Chair, R.P. Taylor

Teaching Staff

Professor Emeritus

F.K. North, M.A., D.Phil. (Oxford)

Professors

Keith Bell, B.Sc. (Leeds), D.Phil. (Oxford) • **R.L. Brown**, B.Sc. (McGill), Ph.D. (Edinburgh) • **Giorgio Ranalli**, D.Geol. (Rome), M.Sc., Ph.D. (Illinois) • **George B. Skippen**, M.Sc. (McMaster), Ph.D. (Johns Hopkins) • **Richard P. Taylor**, B.Sc., Ph.D. (Leicester) • **D.H. Watkinson**, B.Sc., M.Sc. (McMaster), Ph.D. (Pennsylvania State)

Associate Professors

Gail M. Atkinson, B.Sc. (Carleton), M.Eng.Sc., Ph.D. (Western) • **John Blenkinsop**, B.Sc., M.Sc., Ph.D. (British Columbia) • **Sharon D. Carr**, B.Sc. (Calgary), M.Sc., Ph.D. (Carleton) • **George R. Dix**, B.Sc., (Queen's), M.Sc. (Memorial), Ph.D. (Syracuse) • **Frederick A. Michel**, B.Sc. (Queen's), M.Sc., Ph.D. (Waterloo) • **R. Timothy Patterson**, B.Sc., B.A. (Dalhousie), Ph.D. (California at Los Angeles) • **Claudia Schröder-Adams**, B.Sc. (Technical University, Munich), M.Sc. (Christian-Albrechts), Ph.D. (Dalhousie)

Lecturer

I. Munro, B.A. (Western Ontario), M.Sc. (Waterloo)

Adjunct Research Professors

R.J. Berman, Geological Survey of Canada • **M.W. Caldwell**, Canadian Museum of Nature • **S.L. Cumbaa**, Canadian Museum of Nature • **B.L. Cousens**, Department of Earth Sciences, Carleton University • **J.A. Donaldson**, Department of Earth Sciences, Carleton University • **H.L. Gibson**, Department of Geology, Laurentian University • **S. Hanmer**, Geological Survey of Canada • **M.D. Hannington**, Geological Survey of Canada • **J. Kukalova-Peck**, Department of Earth Sciences, Carleton University • **D.A. Leckie**, Wascana Energy Inc., Calgary • **R. Rainbird**, Geological Survey of Canada • **R. Stern**, Geological Survey of Canada

Adjunct Professors

G. Chao • **K. Hooper** • **R. Yole**

Graduation Regulations

In order to graduate, students must fulfill all University graduation Regulations (see p. 48) and all Faculty regulations (see p. 109), in addition to all departmental regulations and requirements as set out below.

The designation of the Honours degree awarded for students in the Honours Geology program will be determined on the basis of their GPA for the 10.5 required credits of Geology as stated in the program requirements.

The designation of the Honours degree awarded for students in the Combined Honours programs will be determined on the basis of their GPA for all required credits in the two major subjects as stated in the respective program requirements.

All Major and Honours students should note that their selection of Science courses, including Mathematics, should be made with the prerequisites for subsequent Geology courses in mind.

The Department of Earth Sciences at Carleton University and the Department of Geology at the University of Ottawa offer an integrated program of Fourth-year courses. With the prior permission of the Department and University, students may enroll in Fourth-year courses offered at the other university. The following list shows the equivalence of similar courses offered by the two departments. Credit is given for only one course in any given pair.

67.403 ★ / GEO 4300 Directed Studies in Earth Sciences
67.422 ★ / GEO 4371 Advanced Mineral Deposits
67.425 ★ / GEO 4342 Groundwater Geochemistry

67.435 ★ / GEO 4365 Carbonate Sedimentology
67.442 ★ / GEO 4322 Advanced Structure
67.451 ★ / GEO 4362 Advanced Igneous Petrogenesis
67.452 ★ / GEO 4363 Advanced Metamorphic Petrology
67.482 ★ / GEO 4381 Geochemistry and Isotope Geology
67.484 ★ / GEO 4391 Exploration Geophysics
67.487 ★ / GEO 4321 Advanced Field Studies
67.498 / GEO 4900 Honours Thesis

It is also possible, with permission, to choose a Fourth-year course without equivalent (67.4xx at Carleton, GEO 4yyy at Ottawa). The following is a list of eligible courses at the University of Ottawa. Students should consult the Calendar of both universities when choosing their Fourth-year program.

GEO 4300 Selected Topics in Earth Sciences
GEO 4312 Taphonomy
GEO 4329 Principles of Rock Deformation
GEO 4332 Permafrost Geomorphology
GEO 4352 Quantitative Analysis in Geology
GEO 4364 Siliciclastic Sedimentology

The courses not included in either of the above lists (67.423 ★, 67.431 ★, 67.432 ★, 67.464 ★, 67.481 ★, 67.483 ★, and 67.485 ★) are usually offered at Carleton, although not all in any given year. Consult course descriptions for details.

Third-year students possessing prerequisites may be admitted to Fourth-year courses with the permission of the Department.

Enrolment in 200-level courses may be restricted due to limited physical resources.

Honours Program

Faculty requirements concerning Honours standing must be maintained. (See p. 109.)

Honours in Geology

1. Courses as prescribed for the Major program are required, except that Geology 67.498 (Thesis) is one of the mandatory credits in Geology, and 1.0 credit in Mathematics beyond First-year level, and/or Computer Science is mandatory in the group of 6.0 credits required in other sciences.
2. The departmental language requirement must be met before completion of the Third year by demonstrating reading proficiency in a language other than English that is acceptable to the Department.

Earth Sciences Co-operative Option

General information on Co-op programs can be found on p. 39.

Operation of the Co-operative Option

The option is administered by the Co-operative Program Committee which is responsible for securing potential employers, arranging interviews, and managing the program. The details of the program are provided in the Earth Sciences Co-op Student Handbook.

Admission Requirements

Students of good standing in the Honours Earth Sciences program may apply for admission to the B.Sc. Honours Co-operative Option, on completion of the First, Second or Third Year of the B.Sc. Honours Earth Sciences program. To be eligible for admission, a student must:

1. be registered as a full-time student in the Earth Sciences Honours program;
2. have an GPA of 8.0 or better in Honours Geology and an overall GPA of 6.5 or better;
3. be eligible to work in Canada.

Meeting the above requirements will only establish eligibility to enter the program. Enrollment in the Co-operative Option is limited and depends on the prevailing job market. Application forms for admission to the Co-operative option are available from the Co-op Office for Engineering and Science and should be submitted before May 15th, September 15th or January 15th.

The Work/Study Sequence

There are 3 four-month work terms. The timing of the employment terms is flexible. Examples include:

- (a) summer employment terms following Years 2, 3 and 4;
- (b) extended summer and fall employment term following Year 3 and summer employment following either Year 2 or Year 4.

If no suitable job placements can be made, the student will revert to the regular Honours program.

Continuation in the Program

During work terms, students must register in one of the three work term courses: 67.201 ★, 67.301 ★, or 67.401 ★; these courses will be graded Sat or Uns.

Combined Honours in Geology and Biology

Program advisers are C.J. Schröder-Adams and S.B. Peck.

Students desiring a comprehensive basic training in both biology and geology may apply for admission to a Combined Honours program, on completion of the First year of the Science program. Applicants must be of Honours standing and must have achieved

grades of C+ or better in Biology 61.103 ★ and 61.104 ★, and Geology 67.100.

Course requirements of this Combined Honours program are as follows:

1. Biology 61.103 ★ and 61.104 ★, Geology 67.100, Mathematics 69.107 ★ and 69.117 ★. One of Chemistry 65.100, Physics 75.101 ★ and 75.102 ★, or 75.107 ★ and 75.108 ★. (The omitted subject, i.e. Chemistry or Physics, must have been taken at the OAC level);
2. 10.0 credits in Biology (or Biochemistry) and Geology beyond First-year level, including at least a 0.5 credit field course. Not more than 6.0 credits in this group should be taken in one department and not more than 6.0 credits may be 200-level courses;
3. Biology 61.498 or Geology 67.498;
4. 0.5 credit in Statistics and 0.5 credit in Computer Science. (Mathematics 69.257 ★ and Computer Science 95.104 ★ are recommended);
5. 3.0 optional credits, at least 2.0 of which must be acceptable credits offered by the Faculties of either Arts and Social Sciences or Public Affairs and Management;
6. 1.0 Science elective credit;
7. A language requirement must be met during the Third year by passing a course in, or demonstrating reading proficiency in, one of French, German, Russian, Spanish, Italian, Latin, Greek or any language acceptable to the committee and in which suitable arrangements can be made for the examination.

Combined Honours in Geology and Chemistry

Program advisers are G.B. Skippen and R.A. Shigeishi.

A grade of C+ or better in both Chemistry 65.100 and Geology 67.100 and overall Honours standing are required for admittance to the program.

Program requirements are as follows:

1. Chemistry 65.100, 65.211 ★, 65.212 ★, 65.232 ★, 65.233 ★, 65.353 ★, 65.354 ★ and 1.0 Chemistry credit at the 400-level;
2. Geology 67.100, 67.223 ★, 67.225 ★, 67.228 ★, 67.281 ★, 1.0 Geology credit at the 300-level and 1.0 Geology credit at the 400-level;
3. Chemistry 65.498 or Geology 67.498;
4. 1.0 Chemistry or Geology credit;
5. Mathematics 69.107 ★, 69.117 ★, 69.207 ★ and 0.5 Mathematics credit at the 200-level;
6. Physics 75.101 ★ and 75.102 ★;
7. 2.0 Science credits, of which 1.0 must be outside Chemistry and Geology;
8. 2.0 arts or social science credits;
9. 1.0 elective credit;
10. A language requirement must be met during the Third year by passing a course in or demonstrating reading proficiency in one of French, German or Russian.

A typical program is as follows:

First Year

Chemistry 65.100;
Geology 67.100;
Mathematics 69.107 ★ and 69.117 ★;
Physics 75.101 ★ and 75.102 ★;
1.0 arts or social science credit.

Second Year

Chemistry 65.211 ★, 65.212 ★, 65.232 ★, 65.233 ★;
Geology 67.223 ★, 67.225 ★, 67.228 ★ and 67.281 ★;
Mathematics 69.207 ★ and 0.5 Mathematics credit at the 200-level.

Third Year

Chemistry 65.353★ and 65.354★;
Geology 67.323★ and 67.324★;
1.0 Chemistry or Geology credit;
1.0 Science credit;
1.0 arts or social science credit.

Fourth Year

Chemistry 65.498 or Geology 67.498;
1.0 Chemistry credit at the 400-level;
1.0 Geology credit at the 400-level;
1.0 Science credit;
1.0 elective credit.

Combined Honours in Geology and Physical Geography

Program adviser is F.A. Michel.

A grade of C+ or better in Geography 45.105/Geology 67.105 and overall Honours standing are required for admittance to the program. Program requirements are as follows:

1. Geology 67.105/Geography 45.105^a, Chemistry 65.100, Mathematics 69.107★ and 69.117★, Physics 75.101★ and 75.102★, or 75.107★ and 75.108★.

2. 5.0 credits in Geology beyond First-year level, including Geology 67.223★, 67.225★, 67.228★, 67.285★^b, 2.0 credits in Geology at the 300-level or above, and 1.0 credit in Geology at the 400-level;

3. 5.0 credits in Physical Geography beyond First-year level from list on p. 261, including Geography 45.210★, 1.5 credit in Physical Geography at the 200-level or above, Geography 45.302★, 45.312★, 45.315★, 45.318★, 1.0 credit in Physical Geography at the 400-level;

4. Geography 45.496 or Geology 67.498;

5. 1.0 credit in Mathematics beyond the 100-level; and/or in Computer Science. (Mathematics 69.257★ and Computer Science 95.104★ are recommended.)

6. 2.0 arts or social science elective credits^c;

7. 2.0 credits chosen from Arts, Social Science, Science or Engineering.

^a Students who have taken Geology 67.100 may, with permission of the program advisers, substitute Geology 67.100 for Geology 67.105/Geography 45.105.

^b Geology 67.285★ precludes additional credit for Geography 45.299★.

^c A Human Geography course is recommended in the program.

Combined Honours in Geology and Geography: Concentration in Terrain Science

Program adviser: To be announced

Terrain science is the study of the Earth's surface as a physical feature: analysis of its geometry and geological origin; modification by climate, surficial processes, and human interaction; surface and groundwater distribution and chemistry; and methods and criteria to evaluate potential use. The program provides a basic framework that allows students to specialize in Fourth year in some aspect of terrain science.

A grade of C+ or better in Geology 67.105/Geography 45.105 and overall Honours standing are required for admittance to the program

Students must consult with the department program adviser about suitable electives and especially concerning possible substitution of courses alternate to those listed. A typical schedule follows:

First Year:

Geology 67.105/Geography 45.105 or Geology 67.100;
Chemistry 65.100;
Mathematics 69.107★ and 69.117★;
Physics 75.101★ and 75.102★ or 75.107★ and 75.108★;
1.0 arts or social science credit.

Second Year

Geology 67.223★, 67.225★, 67.228★, 67.282★, 67.285★;
Geography 45.206★ (Mathematics 69.257★ may be substituted), 45.207★, 45.210★, 45.211★;
Computer Science 95.103★ or 95.104★ or 95.107★.

Third Year

Geology 67.321★, 67.323★, 67.325★, 67.386★;
Geography 45.302★, 45.312★, 45.315★, 45.318★;
1.0 arts or social science credit.

Fourth Year

Geology 67.498 or Geography 45.496;
Geography 45.411★, 45.418★;
1.0 Geology credit at the 400-level;
1.0 Science credit;
1.0 elective credit.

Major Program

The B.Sc. program in Geology is of four years' duration beyond the OSSD or Qualifying-University year. A total of 20.0 credits is required as follows:

1. The credit requirements of the First year of the general B.Sc. program.

2. At least 10.5 credits in Geology, of which Geology 67.100, 67.223★, 67.225★, 67.228★, 67.231★, 67.236★, 67.281★, 67.282★, 67.321★, 67.323★, 67.324★, 67.325★, 67.385★ and 67.386★ are mandatory. (Geology 67.100 may be taken either in Qualifying-University or First year.)

Students who have taken Geology 67.105 and attained a grade of B- or better may, with permission of the Department, substitute that course for 67.100.

3. At least 6.0 credits in the other sciences above Qualifying-University year level. Among these, Mathematics 69.107★ and 69.117★, Chemistry 65.100, and Biology 61.103★ and 61.104★ or Physics 75.101★ and 75.102★, or 75.107★ and 75.108★ are mandatory. At least 3.0 First-year Science credits must be passed before registration for Second-year Geology courses will be permitted, except that, if Geology 67.100 has been taken in Qualifying-University year, a Second-year Geology credit may be substituted.

4. 2.0 approved arts or social science credits.

5. 1.5 credits chosen from Arts, Social Science, Science, or Engineering.

6. A working knowledge of elementary biology is required for Geology 67.231★ and 67.236★. This requirement may be fulfilled by credit for OAC Biology, Biology 61.103★ and 61.104★ or by arrangement with the instructor for extra reading assignments in Geology 67.231★.

A three-year program for students not intending to become professional geologists is also available. Requirements are the same as for the B.Sc. program outlined above except that Geology 67.282★ is not mandatory, no courses above the 300 series are required, and the total credits will number 15.0, including 7.0 Geology credits; at least 5.0 Science credits outside of Geology, which must include Mathematics 69.107★ and 69.117★, Chemistry 65.100 and 1.0 credit from Biology 61.103★ and 61.104★ or Physics 75.101★ and 75.102★, or 75.107★ and 75.108★; 2.0 arts or social science credits and 1.0 optional credit.

A typical program is as follows:

First Year

Geology 67.100 (see Note);

Chemistry 65.100;

Physics 75.101 ★ and 75.102 ★, or 75.107 ★ and 75.108 ★, or Biology 61.103 ★ and 61.104 ★;

Mathematics 69.107 ★, and 69.117 ★;

1.0 credit (arts or social science).

Note: May be replaced by another Science credit if taken in Qualifying-University year.

Second Year

Geology 67.223 ★, 67.225 ★, 67.228 ★, 67.231 ★, 67.236 ★, 67.281 ★ and 67.282 ★;

1.0 First-or Second-year Science credit;

0.5 credit (arts or social science).

Third Year

Geology 67.321 ★, 67.323 ★, 67.324 ★, 67.325 ★, 67.385 ★ and 67.386 ★;

1.0 Second-year Science credit;

0.5 credit (arts or social science);

0.5 credit (Arts and Social Science, Public Affairs and Management, Science or Engineering).

Fourth Year

3.0 Geology credits at the 400-level;

1.0 200-level Science credit;

1.0 credit (Arts and Social Science, Public Affairs and Management, Science or Engineering).

Graduate Courses

For information on graduate courses, please consult the Graduate Studies and Research Calendar.

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Geology 67.100

Principles of Geology

This course is an exploration of essential geological principles and of fundamental questions regarding the Earth. What is the origin and history of the Earth, continents, and oceans? How did life originate and evolve? Are present geological processes the key to understanding the past?

Precludes additional credit for Geology 67.105.

Prerequisite: Enrollment in either Science or Engineering. Students in other programs may register with permission of the Department.

Lectures two hours a week, tutorial one hour a week, laboratory three hours a week, two field excursions.

Geology 67.104 ★

The Evolving Earth

The 4.6 billion year history of plate tectonics, sea level change, and ancient climates. Current global patterns of terrestrial through deep ocean environments, catastrophic events, distribution of solid-earth resources, and impact on society. For non-Science students only; not acceptable for credit in a B.Sc. program. Precludes additional credit for Geology 67.100, Geology 67.105/Geography 45.105, 60.201 ★ and 60.200.

Lectures three hours a week.

Geology 67.105

Introduction to Geoscience

Survey of processes operating within the Earth and at its surface:

the hydrological cycle, oceans, Earth structure, tectonics, rocks, minerals, history of life on the Earth, climatic change, soils, landforms and resources. (Also listed as Geography 45.105.)

Precludes additional credit for Geology 67.100.

Lecture three hours a week, laboratory three hours a week, a field excursion.

Note: Students wishing to continue in a Geology program may, with permission of the Department of Earth Sciences, substitute Geology 67.105 for Geology 67.100.

Geology 67.201 ★

Co-operative Work Term Report 1

This course provides practical experience for students enrolled in the Co-operative Option. To receive course credit a student must receive satisfactory evaluations from their work term employer. Written and oral reports describing the work term project will be required.

Prerequisites: Registration in the Earth Sciences Co-operative Option and permission of the Department.

Four-month work term.

Geology 67.223 ★

Optical Mineralogy

Methods of optical mineralogy and optics of the rock forming minerals.

Precludes additional credit for Geology 67.222 ★.

Prerequisite: Geology 67.100 or 67.105; Chemistry 65.100; or permission of the Department.

Lectures two hours a week, tutorial one hour a week, laboratory three hours a week.

Geology 67.225 ★

Introductory Geochemistry

An introduction to thermodynamics, phase diagrams, and solution chemistry as applied to geological systems. Distribution of the elements.

Precludes Geology 67.221 ★.

Prerequisite: Geology 67.100 or 67.105, Chemistry 65.100; or permission of the Department.

Lectures two hours a week, laboratory three hours a week.

Geology 67.228 ★

Petrology and Geochemistry of Igneous Rocks

The classification of igneous rocks. The chemical characteristics of the crust and mantle. The generation and physical properties of magmas, magma emplacement of volcanic and plutonic rocks. Phase equilibrium and isotope geochemistry.

Prerequisites: Geology 67.223 ★ and 67.225 ★.

Lectures two hours a week, tutorial one hour a week, laboratory three hours a week.

Geology 67.231 ★

Historical Geology and the Fossil Record

Evolution of the earth and its biosphere through geological time, the stratigraphic and fossil record in relationship to geological and paleontological processes, introduction to important fossil groups and their paleoenvironmental implications.

Prerequisite: Geology 67.100 or 67.105; or permission of the Department.

Lectures three hours a week and laboratory three hours a week. May involve one or more field trips.

Geology 67.236 ★

Evolutionary Paleocology

Principles of ecology and paleocology applied to the stratigraphic succession of fossil communities. Current concepts of micro- and macro-evolution and extinction and the synthesis of key paleontological events through the Phanerozoic are emphasized.

Precludes additional credit for Geology 67.332 ★ and 67.333 ★.

Prerequisite: Geology 67.231 ★ or permission of the Department.

Lectures two hours a week, laboratory three hours a week.

Geology 67.238 ★

Environmental and Resource Geology

Enhances appreciation of the resource basis of society and addresses issues related to the extraction and utilization of geological resources. Deals with the role of the Earth Sciences in the forecasting and mitigation of natural disasters such as earthquakes and volcanic eruptions.

Available only as a free elective in the Geology programs.

Prerequisite: Geology 67.100 or 67.104 ★ or Geology 67.105/Geography 45.105, or Interdisciplinary Science 60.201 ★; or permission of the Department.

Lectures three hours a week.

Geology 67.241 ★

Dinosaurs

A general introduction to dinosaurs, their place in evolution, their social behaviour, the Mesozoic landscape, extinction theories, and public perception of dinosaurs.

Accepted as a free elective only in all Science programs.

Lectures three hours a week.

Geology 67.242 ★

Climate Change: An Earth Sciences Perspective

An exploration of the often dramatic climate changes that have occurred through earth history from a geological perspective, emphasizing the history of earth climates, geological causes of climate change, and impact that rapid climate change has had on the biosphere.

Accepted as a free elective only in all Science programs.

Lectures three hours a week.

Geology 67.243 ★

Introduction to Oceanography

An environmental approach to understanding the oceans which cover over 70 percent of the Earth's surface; deals with origins, physical and organic components and processes, geological marine resources and marine pollution.

Accepted as a free elective only in all Science programs.

Lectures three hours per week.

Geology 67.244 ★

Engineering Geology

Overview of geological processes essential for understanding engineering problems. Topics include: geologic cycle; classification of rocks; stratigraphy; geological structures; physical and chemical weathering; erosion, transportation, and depositional environments; definition, classification and properties of soils; physical and geochemical aspects of groundwater; and geophysical techniques. Precludes additional credit for Geology 67.100, 67.104 ★ and 67.105.

Prerequisites: Registration in B.Eng; Chemistry 65.111 ★; or permission of the Department.

Lectures three hours a week, laboratory three hours alternate weeks, a field excursion.

Geology 67.281 ★

Field Geology I

An introduction to the study of rocks from the Precambrian and Phanerozoic Eras. Geologic mapping techniques are emphasized. A mandatory two-week field camp before classes in the Fall with additional laboratories and field trips during the Fall term.

Precludes Geology 67.285 ★ as a Science credit for students in Geology program but may be taken as a Free Elective.

Prerequisites: Geology 67.100 or Geology 67.105/Geography 45.105 and completion of First-year Science program; or permission of the Department.

Geology 67.282 ★

Field Geology II

An introduction to methods of field analysis and interpretation in deformed and metamorphosed terranes. The course includes a two-week field camp to be taken in early May.

Prerequisites: Geology 67.281 ★ and permission of the Department.

Lectures one hour a week, laboratory three hours a week, two-week field camp in early May.

Geology 67.285 ★

Environmental Field Geology

The geology of the environment studied in the field. The course includes exercises on topics such as hydrogeology, limnology and Pleistocene Geology. A mandatory two-week field camp before classes begin in the Fall.

Precludes Geology 67.281 ★ as a Science credit for students in the Geology programs but may be taken as a Free Elective.

Prerequisites: Geology 67.100 or Geology 67.105/Geography 45.105 and completion of the First-year Science program; or permission of the Department.

Geology 67.301 ★

Co-operative Work Term Report 2

This course provides practical experience for students enrolled in the Co-operative Option. To receive course credit a student must receive satisfactory evaluations from their work term employer. Written and oral reports describing the work term project will be required.

Prerequisites: Registration in the Earth Sciences Co-operative Option and permission of the Department.

Four-month work term.

Geology 67.321 ★

Sedimentary Environments

Principles of sediment transport, and classification of sedimentary rocks and structures, as applied to interpretation of sedimentary facies within the context of sequence stratigraphy.

Prerequisite: Geology 67.281 ★ or 67.285 ★; or permission of the Department.

Lectures two hours a week and laboratories three hours a week. May involve one or more field trips.

Geology 67.323 ★

Petrology and Geochemistry of Metamorphic Rocks

The classification of metamorphic rocks. The origin of metamorphic rocks with emphasis on the chemical and mineralogical characteristics of these rocks and the processes involved in their evolution. Related phase equilibria and thermodynamics.

Prerequisite: Geology 67.223 ★.

Lectures two hours a week, laboratory three hours a week, one day long field trip.

Geology 67.324 ★

Mineral Deposits

Metallic and non-metallic ore deposits, property valuation, mineral economics, exploration geochemistry, stable isotope and trace element geochemistry, partition coefficients.

Prerequisites: Geology 67.321 ★ and 67.323 ★; or permission of the Department.

Lectures two hours a week and laboratory three hours a week, one day long field trip.

Geology 67.325 ★

Physical Hydrogeology

An introduction to the principles governing the movement of groundwater through various geological materials. The exploration, development and use of groundwater as a resource by man, and groundwater-related geohazards are examined.

Precludes additional credit for Geology 67.424 ★.

Prerequisites: Geology 67.100 or 67.105/Geography 45.105; or permission of the Department.

Lectures two hours a week, laboratory two hours a week.

Geology 67.385 ★**Geodynamics**

The structure, composition, and rheological properties of the Earth: lithosphere, mantle and core. Plate tectonics and its relation to geophysical fields, driving mechanisms, and processes at plate boundaries and in plate interiors.

Precludes additional credit for Geology 67.380 or 67.382 ★.

Prerequisites: Geology 67.228 ★; 67.281 ★ or 67.285 ★; and 67.282 ★; or permission of the Department.

Lectures two hours a week, laboratory three hours a week.

Geology 67.386 ★**Structural Geology**

Structure and tectonic evolution of mountain belts; analysis of strain and fabrics in a variety of crustal settings. Applications to geological engineering and mineral and petroleum exploration.

Precludes additional credit for Geology 67.380 or 67.381 ★.

Prerequisites: Geology 67.385 ★ or permission of the Department.

Lectures two hours a week, laboratory three hours a week.

Geology 67.401 ★**Co-operative Work Term Report 3**

This course provides practical experience for students enrolled in the Co-operative Option. To receive course credit a student must receive satisfactory evaluations from their work term employer. Written and oral reports describing the work term project will be required.

Prerequisites: Registration in the Earth Sciences Co-operative Option and permission of the Department.

Four-month work term.

Geology 67.403 ★**Directed Studies in Geology**

One or more projects involving at least 15 days field and/or laboratory research, not related to thesis research. Assessment based on written reports and an oral presentation. Expenses for long-distance travel are borne by the student.

Prerequisites: Honours standing and permission of the Department.

Hours to be arranged.

Geology 67.415 ★**Quaternary Geography**

Changes in the physical environment of the earth during the last 2 million years; methods of studying recent earth history; the last ice age in Canada. (Also listed as Geography 45.411 ★.)

Note: Geology 67.321 ★ and Geography 45.312 ★ are recommended.

Lectures three hours a week.

Geology 67.417 ★**Geotechnical Mechanics**

Soil composition and soil classification. Soil properties, compaction, seepage and permeability. Concepts of pore water pressure, capillary pressure and hydraulic head. Principle of effective stress, stress-deformation and strength characteristics of soils, consolidation, stress distribution with soils, and settlement. Laboratory testing. (Also listed as Engineering 82.328 ★, Geography 45.417 ★.)

Precludes additional credit for Geography 45.424 ★.

Prerequisites: Geology 67.244 ★ or equivalent and Third-year registration, or permission of the Department.

Lectures three hours a week, laboratory three hours alternate weeks.

Geology 67.422 ★**Metallic Mineral Deposits**

Ore deposits studied from their relationships to the petrologic cycle. Ore genesis interpreted in light of field studies of local deposits, reflected light microscopy of ore suites, description of classic deposits, phase equilibria and isotopic evidence.

Prerequisites: Geology 67.323 ★ and 67.324 ★.

Lectures, seminars and laboratories five hours a week.

Geology 67.423 ★**Petroleum Geology**

Principles and methods of petroleum exploration geology with emphasis on the Western Canada Sedimentary Basin.

Prerequisites: Geology 67.231 ★, 67.321 ★, 67.386 ★; or permission of the Department.

Lectures, seminars and laboratories five hours a week.

Geology 67.425 ★**Geochemistry of Waters**

The principles and processes controlling the chemical quality of groundwater and the subsequent effects on water quality due to human activities. Isotope geochemistry of the hydrologic cycle and dissolved constituents in groundwater.

Precludes additional credit for Geology 67.420 ★.

Prerequisites: Geology 67.325 ★ and Chemistry 65.100, or permission of the Department.

Geology 67.431 ★**Microfossils**

Oceanological and marine geological processes; micro-organisms of the oceans; microfossils: their evolution, biostratigraphic and paleoecological significance and economic use; microfaunal correlation in petroleum geology. Laboratory: Examination and identification of microfossils.

Prerequisite: Geology 67.231 ★ or permission of the Department.

Lectures and laboratories five hours a week.

Geology 67.432 ★**Marine Geology**

Development of ocean basins, physical and chemical oceanographic processes, paleoceanographic changes of watermass distribution and circulation patterns, interaction between atmosphere and ocean, marine sedimentation, offshore seismic stratigraphy, marine habitats, marine instrumentation.

Prerequisites: Geology 67.231 ★, 67.321 ★; 67.385 ★; or permission of the Department.

Lectures, seminars and laboratories five hours a week.

Geology 67.435 ★**Carbonate Sedimentology**

Aspects of modern depositional systems, dynamic facies models, sequence stratigraphy, mineralogy, and diagenesis of carbonate sediments. Practical part of the course will introduce various techniques in carbonate sedimentology (mapping, petrography, staining, cathodoluminescence, fluorescence, SEM).

Precludes additional credit for Geology 67.463 ★.

Prerequisites: Geology 67.321 ★ or permission of the Department.

Lectures two hours a week and a three-hour laboratory.

Geology 67.442 ★**Advanced Structure**

A study of the structural evolution of mountain belts, with emphasis on field methods.

Prerequisites: Geology 67.385 ★ and 67.386 ★; or permission of the Department.

Lectures, seminars and laboratories five hours a week.

Geology 67.451 ★**Igneous Petrology**

Genesis of plutonic and volcanic rocks, their spatial and petrochemical relationships and crust-mantle differentiation; associated problems in phase equilibria and isotopic studies. One day-long field trip.

Prerequisite: Geology 67.323 ★.

Lectures and laboratories five hours a week.

Geology 67.452★

Metamorphic Petrology

Field relations of metamorphic rocks; graphical treatment and interpretation of mineral assemblages. Laboratory: Petrographic techniques, study of rock suites.

Prerequisite: Geology 67.323★.

Geology 67.464★

Precambrian Geology

Introduction to problems of the Precambrian, emphasizing both classical and current North American studies. Laboratory: research methods, field trips, petrologic studies of representative rock suites.

Prerequisite: Geology 67.323★.

Geology 67.477★

Engineering Seismology

Seismological topics with engineering applications. Characterization of seismicity and seismic sources (areas and faults). Seismic hazard analysis. Empirical and theoretical modeling of strong ground motion in time and frequency domains.

Prerequisites: Geology 67.385★ and 67.386★; or permission of the department.

Lectures two hours a week.

Geology 67.481★

Physics of the Earth

The physical properties of the solid Earth. Gravitational, magnetic and palaeomagnetic fields; seismology and earthquake occurrence; heat flow and thermal history. Geodynamic processes.

Prerequisites: Geology 67.385★ and 67.386★; or permission of the Department.

Geology 67.482★

Geochemistry and Isotope Geology

Chemical evolution of the Earth, meteorites, development of the continental crust, origin of the atmosphere and hydrosphere, radiometric dating, stable isotopes, origin of life.

Prerequisites: Geology 67.323★ and 67.324★; or permission of the Department.

Lectures and seminars five hours a week.

Geology 67.483★

Applied Geochemistry

Chemical and physical factors responsible for the distribution and migration of the elements in the lithosphere, hydrosphere, atmosphere and biosphere; geochemistry applied to mineral exploration; methods of analysis. Laboratory: determination of trace amounts of the common metallic elements in soils and stream sediments; case histories, research problems, field trips.

Prerequisites: Geology 67.228★, 67.324★, Chemistry 65.100; or permission of the Department.

Geology 67.484★

Exploration Geophysics

An introduction to the fundamental theory and application of geophysics to economic and structural geology. Methods studied are electrical, gravitational, magnetic, radioactive and seismic. Case history studies integrate the application of the methods.

Prerequisites: Geology 67.385★ and 67.386★, Physics 75.101★ and 75.102★, or 75.107 and 75.108★; or permission of the Department.

Lectures and problems three hours a week.

Geology 67.485★

Data Integration and Analysis in the Geosciences

Integration and analysis of spatial data in a Geographical Information System environment. Topics include acquisition, representation, analysis, and modelling of geological, geophysical, geochemical, and remotely-sensed data.

Prerequisites: Completion of the Second-Year Geology course requirements in Earth Sciences, or permission of the Department.

Lectures and laboratory five hours a week.

Geology 67.487★

Field Geology III

Two-week field camp designed to extend the student's geological knowledge by integrating advanced field, theory and experimental data. Assessment based on written reports, seminars, and oral examinations. Part of the cost is borne by the student.

Prerequisites: Completion of the Third-year Geology course requirements and permission of the Department.

Geology 67.498

Honours Thesis

Independent studies. Requires prior written approval of a topic from a supervisor and the course co-ordinator. Oral and written proposal, progress and defence reports are required.

Prerequisite: Completion of the Third-Year Geology course requirements.

Economics

(Public Affairs and Management)

C874 Loeb Building
Telephone: 520-3744

Academic Administration

Chair, P.N. Rowe

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Supervisor of B.A. (Honours) Studies, J.C. McManus

Ph.D. Studies, R.A. Brecher

Supervisor of B.A. Studies, E.G. Davis

Teaching Staff

Professor Emeritus

E.G. West, M.Sc., Ph.D. (London)

Professors

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Associate Professors

Zhiqi Chen, B.A. (Nanjing), M.A. (Carleton), Ph.D. (Western Ontario) • Eric G. Davis, B.Sc. (Queen's), Ph.D. (Brown) • Fanny Demers, B.A. (Bogazici), M.B.A. (McGill), M.A., Ph.D. (Johns Hopkins) • Michel Demers, B.A., M.A. (McGill), M.A., Ph.D. (Johns Hopkins) • Brian Erard, B.A. (Notre Dame), M.A., Ph.D. (Michigan) • J.S. Ferris, B.Com., M.A. (Toronto), Ph.D. (California) • John C. McManus, B.A., M.A. (Western Ontario), Ph.D. (Toronto) • Simon Power, B.A. (Durham), M.A. (London), M.A. (Saskatchewan), Ph.D. (Western Ontario) • P. Nicholas Rowe, B.A. (Stirling), M.A., Ph.D. (Western Ontario) • Huntley Schaller, B.A. (McGill), Ph.D. (Massachusetts Institute of Technology) • Lawrence L. Schembri, B.Com. (Toronto), M.Sc. (London), Ph.D. (Massachusetts Institute of Technology) • Aileen Thompson, B.A. (Smith College), Ph.D. (Michigan) • Frances Woolley, B.A. (Simon Fraser), M.A. (Queen's), Ph.D. (London School of Economics).

Assistant Professors

Keir Armstrong, B.A. (Toronto), Ph.D. (British Columbia) • Nancy Churchman, B.A. (Carleton), M.A., Ph.D. (Toronto)

Distinguished Research Professors

C.J. Maule • Carl H. McMillan, Jr. • T.K. Rymes

Adjunct Research Professors

J. Baldwin • H.E. English • J.A. Galbraith

Adjunct Professors

Caswell L. Johnson • R.F. Neill

Graduation Regulations

In order to graduate, students must fulfill all University graduation regulations, (see p. 48) all Faculty regulations including those relating to First-Year Seminars and Breadth requirements (see p. 63), and all Major regulations and requirements as set out below.

Mathematics Requirements

Students intending to pursue courses in Economics beyond the introductory level are required to take Mathematics 69.007 ★ if they lack an OAC in Calculus, and 69.017 ★ if they lack an OAC in Algebra and Geometry.

Honours Programs

The Honours programs may be entered in First year or by transfer from the B.A. programs if minimum Honours standing has been obtained. The student's program for the second and subsequent

years must be planned in consultation with the Supervisor of Honours Studies of the Department.

Honours in Economics

The requirement for an Honours degree is a minimum of 20.0 credits with at least 9.0 credits in Economics and 1.0 credit in Mathematics. The Honours requirements include: Mathematics 69.109 ★ and 69.119 ★ or equivalent; Economics 43.100 or First-Year Seminar 01.103, 43.202 ★, 43.203 ★, 43.212 ★, 43.213 ★, 43.220, 43.240 ★, 43.420 ★, 43.421 ★, 43.476 ★, 43.490, plus 2.0 additional credits in Economics at the 400-level.

An Honours Essay (Economics 43.498) with a grade of B- or better may be written to earn 1.0 credit at the 400-level, and can replace the Economics 43.490 requirement. Students who choose to do the Honours Essay must have a detailed outline of the Essay approved by their adviser and by the Honours Supervisor before the last day for withdrawal from full-credit courses. In the

absence of such an approved outline, the Department may require the student to withdraw from the Honours Essay.

For students graduating in the Honours program in Economics, the overall graduation average shall be calculated over all successfully completed, graded courses used to meet the degree requirements. The graduation average in Economics shall be calculated over all successfully completed, graded required Economics courses counting towards the degree. Where more than the required minimum of non-specified Economics courses has been taken, the courses with the highest grades shall be used in the calculation of the graduation average.

Minor in Economics

Students may obtain a "Minor in Economics" designation on their transcript and diploma by completing the 4.0 credits specified below, with a GPA of 4.0 or better in Economics.

Required Courses (2.0 credits)

43.100 or First-Year Seminar 01.103, 43.201 ★ or 43.202 ★, 43.211 ★ or 43.212 ★.

2.0 additional credits in Economics beyond the 100-level.

(Of these 4.0 credits, 2.0 must be taken at Carleton University)

Normal Course Pattern in Honours Economics

First Year: Economics 43.100 or First-Year Seminar 01.103, Mathematics 69.109 ★ and 69.119 ★.

Second Year: Economics 43.202 ★, 43.203 ★, 43.212 ★, 43.213 ★, 43.220, 43.240 ★.

(Students should note that: an average grade of C+ or better in 43.202 ★ and 43.203 ★ is required to take 43.420 ★; an average grade of C+ or better in 43.212 ★ and 43.213 ★ is required to take 43.421 ★; a grade of C+ or better in 43.220 is required to take 43.476 ★.)

Third Year: Economics 43.420 ★ and 43.421 ★, 43.476 ★, 0.5 additional Economics credit at the 400-level.

Fourth Year: Economics 43.490, 1.5 Economics credits at the 400-level.

Other course patterns may be arranged after consultation with the Supervisor of Honours Studies.

B.A. (Honours) with a Concentration in Financial Economics

Core Economics courses for this concentration are:

Economics 43.100 or First-Year Seminar 01.103, 43.202 ★, 43.203 ★, 43.212 ★, 43.213 ★, 43.220, 43.240 ★, 43.420 ★, 43.421 ★, 43.476 ★, 43.490 or 43.498.

Required Concentration Courses:

42.101 ★, 42.102 ★, 43.254 ★ (42.254 ★), 43.255 ★ (42.255 ★), 43.350 ★ (42.350 ★), 43.351 ★ (42.351 ★), 43.408 ★ (42.450 ★), 43.411 ★ (42.452 ★).

Normal Course Pattern for the B.A. (Honours) with a Concentration in Financial Economics:

First Year: Economics 43.100 or First-Year Seminar 01.103; Business 42.101 ★ and 42.102 ★; Mathematics 69.109 ★ and 69.119 ★; 2.0 credits options

Second Year: Economics 43.202 ★ and 43.203 ★, 43.212 ★ and 43.213 ★, 43.220, 43.240 ★, 43.254 ★ (42.254 ★), 43.255 ★ (42.255 ★), 0.5 credit option

Third Year: Economics 43.420 ★ and 43.421 ★, 43.476 ★, 43.350 ★ (42.350 ★), 43.351 ★ (42.351 ★), 2.5 credits options

Fourth Year: Economics 43.490/43.498, 43.408 ★ (42.450 ★), 43.411 ★ (42.452 ★), 3.0 credits options

The minimum GPA required in the courses in this concentration is 6.5. The concentration in Financial Economics is available to students in the B.A. program. However, it is unlikely that a student could meet the requirements of the concentration within the 15.0 credits required for the B.A. degree.

Combined Honours

Students may apply for Combined Honours in Economics and another discipline. Students should consult the Supervisor of Honours Studies.

Students in the Combined Honours program are normally required to take 1.0 credit in Mathematics and at least 7.0 credits in Economics, of which 2.5 credits are at the 400-level. The requirements are: Mathematics 69.109 ★ and 69.119 ★ or equivalent; Economics 43.100 or First-Year Seminar 01.103, 43.202 ★, 43.203 ★, 43.212 ★, 43.213 ★, 43.220, 43.240 ★, 43.420 ★, 43.421 ★, 43.490, and an additional 0.5 credit at the 400-level. The Honours Essay (Economics 43.498) with a weight of 1.0 credit, requiring a grade of B- or better, may be written in Economics and can replace the Economics 43.490 requirement.

The minimum of 20.0 credits and the procedure for computing final standing described above apply to the Combined Honours program.

The Combined Honours programs in four related fields are described in greater detail below.

Normal Course Pattern in Combined Honours in Economics

First Year: Economics 43.100 or First-Year Seminar 01.103; Mathematics 69.109 ★ and 69.119 ★.

Second Year: Economics 43.202 ★, 43.203 ★, 43.212 ★, 43.213 ★, 43.220 (or recognized equivalent), 43.240 ★.

Third Year: Economics 43.420 ★ and 43.421 ★.

Fourth Year: Economics 43.490 and 1.0 additional 0.5 credit in Economics at the 400-level.

Other course patterns may be arranged after consultation with the Supervisor of Honours Studies.

Combined Honours in Economics and Political Science

The program requires 1.0 credit in Mathematics (69.109 ★ and 69.119 ★), 7.0 credits in Economics and 6.0 credits in Political Science. The Economics requirements include:

Economics 43.100 or First-Year Seminar 01.103, 43.202 ★, 43.203 ★, 43.212 ★, 43.213 ★, 43.220, 43.240 ★, 43.420 ★, 43.421 ★, 43.490 and 0.5 credit at the 400 level.

Combined Honours in Economics and Journalism

Students in this program are required to complete a total of 20.0 credits (20.5 credits if admitted prior to 1995-96) and may choose to graduate with either a B.A. (Honours) or B.J. (Honours). The Economics requirements are Mathematics 69.109 ★ and 69.119 ★, Economics 43.100 or First-Year Seminar 01.103, 43.202 ★, 43.203 ★, 43.212 ★, 43.213 ★, 43.220, 43.240 ★, 43.420 ★, 43.421 ★, 43.490; 1.0 approved credit in Economic History and 0.5 credit option in Economics at the 400-level. The Journalism requirements are: a language course, preferably French, (acceptable 100-level French courses are one of French 20.120, 20.130, 20.140 or 20.150), Journalism 28.100, 28.221, 28.225 ★, 28.251 ★, 28.400, 28.421, and two of 28.425 ★, 28.426 ★, 28.427 ★, 28.428 ★.

Combined Honours in Economics and Sociology

The Economics requirements are: Mathematics 69.109 ★ and

69.119 ★, Economics 43.100 or First-Year Seminar 01.103, 43.202 ★, 43.203 ★, 43.212 ★, 43.213 ★, 43.220 (or Sociology 53.370), 43.240 ★, 43.420 ★, 43.421 ★, 43.490 and a 0.5 credit at the 400-level.

See also p. 441 and consult the Department of Sociology and Anthropology.

B.A. Programs

B.A. Program in Economics

The requirements are: Mathematics 69.109 ★ and 69.119 ★ and at least 6.0 credits in Economics: Economics 43.100, or First-Year Seminar 01.103; 43.202 ★, 43.203 ★, 43.212 ★, 43.213 ★, 43.220, and 2.0 other credits in Economics. Students are normally permitted to major in Economics only if they have obtained a grade of C- or better in Economics 43.100 or First-Year Seminar 01.103.

A B.A. student must maintain a GPA of 4.0 or better to remain in the program. For purposes of determining a B.A. student's average at graduation, only the 6.0 required credits in Economics (i.e. excluding 69.109 ★ and 69.119 ★) will be considered.

Graduate Program

The Department of Economics offers studies leading to the degree of Master of Arts and to the degree of Doctor of Philosophy. For further details consult the Graduate Studies and Research Calendar.

Requirement for Breadth, for students in B.A. or B.A.(Honours) degrees

Category for Breadth	Courses in this unit
The temporal dimension of human societies, analyzing times before the present era or societies other than our own	(43.)235
The artifacts of the imagination in literature and/or other forms, or that addresses the life of the imagination and culture.	
The understanding of social, technological and/or natural processes and the ways in which that understanding is obtained in science and social science.	All Economics courses not listed in any other category
Matters of human values, ethics and social responsibilities	

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

First-Year Seminar in Economics 01.103

Introduction to Economics

Introduction to the major tools and policy problems of economics. Economic analysis is applied to a variety of contemporary problems such as pollution, poverty, the control of monopoly, unemployment, inflation and international economic problems. Limited enrolment.

Precludes additional credit for Economics 43.100.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Lectures three hours a week and one hour discussion group weekly.

Economics 43.100

Introduction to Economics

An introduction to the major tools and policy problems of economics. Economic analysis is applied to a variety of contemporary problems such as pollution, poverty, the control of monopoly, unemployment, inflation and international economic problems.

Precludes additional credit for First-Year Seminar 01.103.

Lectures three hours a week and discussion group one hour every two weeks.

Economics 43.201 ★

Intermediate Microeconomics for Non-Majors

The main topics in microeconomic theory with illustrations of their applications. Not open to students in Economics or the Bachelor of Commerce program.

Precludes additional credit for Economics 43.202 ★ or 43.203 ★.

Prerequisite: Economics 43.100 or First-Year Seminar 01.103, or permission of the Department.

Lectures three hours a week.

Economics 43.202 ★

Intermediate Microeconomics I

An analysis of consumer demand, production, costs and an introduction to market structures, with special reference to the determination of conditions which maximize social welfare.

Precludes additional credit for Economics 43.201 ★.

Prerequisites: Economics 43.100 or First-Year Seminar 01.103, (grade of C- or better); and Mathematics 69.109 ★, which may be taken concurrently with Economics 43.202 ★.

Lectures three hours a week.

Economics 43.203 ★

Intermediate Microeconomics II

An analysis of distribution, market structures and general equilibrium theory, with special reference to the determination of conditions that maximize social welfare.

Precludes additional credit for Economics 43.201 ★.

Prerequisite: Economics 43.202 ★.

Lectures three hours a week.

Economics 43.211 ★

Intermediate Macroeconomics for Non-Majors

The main topics in macroeconomic theory with illustrations of their application. Not open to students in Economics or the Bachelor of Commerce program.

Precludes additional credit for Economics 43.212 ★ or 43.213 ★.

Prerequisite: Economics 43.100 or First-Year Seminar 01.103, or permission of the Department.

Lectures three hours a week.

Economics 43.212 ★

Intermediate Macroeconomics I

An examination of the standard macroeconomic model of a closed economy, emphasizing both the aggregate demand and the aggregate supply side of the economy. The model is used to analyze basic macroeconomic problems and evaluate proposed solutions of these problems.

Precludes additional credit for Economics 43.211 ★.

Prerequisite: Economics 43.100 or First-Year Seminar 01.103, (grade of C- or better); and Mathematics 69.109 ★, which may be taken concurrently with Economics 43.212 ★.

Lectures three hours a week.

Economics 43.213 ★

Intermediate Macroeconomics II

An extension of the standard macroeconomic model to include topics such as macroeconomic theory and policy in an open economy, theoretical development and empirical analysis of basic macro rela-

tionships, the short-run dynamics of wage-price adjustment and economic growth.

Precludes additional credit for Economics 43.211 ★.

Prerequisite: Economics 43.212 ★.

Lectures three hours a week.

Economics 43.220

Statistical Methods in the Social Sciences

An introduction to statistical inference. Topics covered include probability theory, estimation, sampling distributions, two-population inference, tests of goodness of fit and independence, correlation, simple and multiple linear regression with residual analysis, and analysis of variance.

Precludes additional credit for Geography 45.206 ★, Mathematics 69.257 ★, 69.259 ★, 69.266 ★, 69.267 ★, Psychology 49.300, and Sociology 53.370.

Prerequisites: Mathematics 69.109 ★ and 69.119 ★ (or equivalent); or

permission of the Department. These courses may be taken concurrently with Economics 43.220. For students in the Bachelor of International Business program, the prerequisite is successful completion of Business 42.173.

Lectures three hours a week, tutorials one hour a week.

Economics 43.235

Canadian Economic History

A historical survey of persistence and change in the Canadian economy from the eighteenth to the twentieth centuries. (Also listed as History 24.235.)

Prerequisite: Economics 43.100 or First-Year Seminar 01.103, or permission of the Department.

Lectures three hours a week.

Economics 43.240 ★

Economic Applications of Mathematics

Optimization, with and without constraints, and comparative static methods applied to models such as utility maximization and least cost production; homogenous functions; compounding and exponential functions; economic models involving integration; the use of matrix algebra and differential equations.

Prerequisites: Economics 43.100 or First-Year Seminar 01.103, and Mathematics 69.109 ★ and 69.119 ★. Enrolment in this course is limited to students whose major is Economics or Business.

Lectures three hours a week.

Economics 43.254 ★

Essentials of Business Finance

Business firms' financing, capital investment, and dividend policy decisions, cost of capital and short-term asset management problems. (Also listed as Business 42.254 ★.)

Precludes additional credit for Economics 43.250 ★.

Prerequisites: Business 42.104 ★ and Business 42.105 ★ (or 42.101 ★ and 42.102 ★) with grade of C- or better in each. For students in the Bachelor of International Business or in the Management Concentration in Civil and Environmental Engineering: Business 42.270 ★ (with a grade of C- or better).

Lectures three hours a week.

Economics 43.255 ★

Business Finance

Capital investment and financing decisions in the context of risk and return tradeoffs. Primary and derivative securities, and their role in risk management. Topics include mergers, corporate restructuring, the theory of principal-agent relationships, and financial planning, forecasting, and control. (Also listed as Business 42.255 ★.)

Precludes additional credit for Economics 43.250 ★.

Prerequisites: Economics 43.254 ★, Economics 43.100 or First-Year Seminar 01.103, Mathematics 69.109 ★ (or its equivalent) and 69.119 ★ (or its equivalent). For students in the Bachelor of International Business program the Mathematics courses can be re-

placed by Business 42.173. For students in the Management Concentration in Engineering, Economics 43.100 can be replaced by Civil and Environmental Engineering 91.380 ★.

Lectures three hours a week.

Economics 43.305 ★

Selected Topics in Economic History

Examination of the economic development of North America or Europe or other possible selected sets of countries. Countries examined vary from year to year.

Prerequisite: Economics 43.100 or First-Year Seminar 01.103, or permission of the Department.

Lectures three hours a week.

Economics 43.310 ★

Women in the Economy

Topics include women's and men's paid work and earnings; discrimination; unpaid work and the value of household production; family decision making and intra-household resource allocation; gender and macroeconomic policy; women and poverty; feminist approaches to economic theory.

Prerequisites: Economics 43.100 or First-Year Seminar 01.103.

Lectures three hours a week.

Economics 43.320 ★

Economics of Information and the Media

An introduction to the economics of information and the media, with a focus on the analysis of production and distribution of information, the application of theory to selected communications-media industries in Canada, and the analysis of existing Canadian policies.

Precludes additional credit for Economics 43.425 ★.

Prerequisite: Economics 43.100 or First-Year Seminar 01.103.

Lectures three hours a week.

Economics 43.324 ★

An Economic Analysis of Law

An introduction to the application of economic principles and methodology to a variety of legal problems with particular emphasis on the theory of property rights and the allocation of resources.

Prerequisite: Economics 43.100 or First-Year Seminar 01.103.

Lectures three hours a week.

Economics 43.325

The Economic Development of Canada

A general survey of Canadian economic development from 1534 to 1970.

Prerequisite: Economics 43.100 or First-Year Seminar 01.103, or permission of the Department.

Lectures three hours a week.

Economics 43.326 ★

Economic Theories of Federalism

Economic dimensions of federalism, with reference to Canadian experience. Issues include: fiscal federalism; impact of federal economic policies on provincial economies, decentralization possibilities for fiscal and economic development policies, consequences of policies such as provincial trade barriers and impediments to factor flows.

Prerequisite: Economics 43.100 or First-Year Seminar 01.103.

Lectures three hours a week.

Economics 43.330 ★

Public Policy Toward Business

The interaction of government and business in the Canadian economy. Reasons for government involvement in selected public policy areas. Topics covered may include competition policy; regulation of firms by boards and commissions, environmental regulation and public enterprise.

Precludes additional credit for Economics 43.431 ★.

Prerequisite: Economics 43.100 or First-Year Seminar 01.103.

Lectures three hours a week.

Economics 43.335

Political Economy in the Modern State

An examination of the role of government in the economy, with special emphasis on alternate forms of social co-ordination and the advantages and disadvantages of each form in the Canadian system.

Prerequisite: Economics 43.100 or First-Year Seminar 01.103.

Lectures two hours a week.

Economics 43.341 ★

Regional Economics

Unequal distribution of economic activity between spatially defined regions. The pattern in Canada since World War II, and the outlook for the future is evaluated, considering "natural" adjustment mechanisms, and policy tools.

Prerequisite: Economics 43.100 or First-Year Seminar 01.103.

Lectures three hours a week.

Economics 43.342 ★

Special Studies in Economics

Content of this course varies year by year, topics to be determined by the instructor invited to offer the course.

Prerequisite: Economics 43.100 or First-Year Seminar 01.103.

Lectures three hours a week.

Economics 43.344 ★

Economic Thought and Policy in Canada

An account of the interrelationship between economic theories expounded in Canada and their issue in national policy.

Prerequisite: An introductory course in one of the social sciences or Canadian history.

Lectures three hours a week.

Economics 43.346 ★

Agricultural Economics

An examination of the agricultural industry in the national economy and in low-income societies. The course emphasizes the working out of the basic forces that determine supply-demand for the industry and the functional distribution of income among the factors of production. The place of institutions is examined and public policy is critically reviewed.

Prerequisite: Economics 43.100 or First-Year Seminar 01.103.

Lectures three hours a week.

Economics 43.347 ★

Public Finance: Taxation

The role and nature of the government sector in the economy, the principles of taxation, tax equity, the incidence and excess burden of taxes, the structure of taxes in the Canadian economy, the role of personal, corporate, sales and wealth taxes in the economy, fiscal stabilization policy, and the economics of public debt.

Precludes additional credit for Economics 43.303 ★ and 43.441 ★.

Prerequisite: Economics 43.100 or First-Year Seminar 01.103.

Lectures three hours a week.

Economics 43.348 ★

Public Finance: Expenditure

The role and nature of the government sector in the economy, the theory of public goods, the equity and efficiency effects of public expenditures, voting rules and fiscal politics, techniques of public expenditure analysis, and intergovernmental fiscal relations.

Precludes additional credit for Economics 43.303 ★ and 43.442 ★.

Prerequisite: Economics 43.100 or First-Year Seminar 01.103.

Lectures three hours a week.

Economics 43.350 ★

Corporate Finance

An examination of the major issues in corporate finance and applied financial management. Topics include: introduction to portfolio theory, the capital asset pricing model, cost of capital, capital

structure and dividend policy, lease financing, capital budgeting under uncertainty, mergers and consolidations. (Also listed as Business 42.350 ★.)

Prerequisites: Economics 43.202 ★, 43.250 ★ or 43.255 ★, and 43.220 or Mathematics 69.267 ★.

Lectures three hours a week.

Economics 43.351 ★

Principles of Investments

Procedures and methods of investment analysis. The stock and bond markets. Government regulation of securities markets. Valuation of common stocks and fixed income securities. Options, warrants, convertibles and commodities. (Also listed as Business 42.352 ★.)

Prerequisites: Economics 43.250 ★ or 43.255 ★, and Economics 43.220 or Mathematics 69.267 ★.

Lectures three hours a week.

Economics 43.356 ★

Introduction to Labour Economics

Basic principles of labour economics including market, institutional and sociological forces. Issues such as technology and labour demand, wage systems, human capital, internal wage structure, market discrimination, female labour-force entry, wage/price spiral, household labour supply, wage determination are considered.

Prerequisite: Economics 43.100 or First-Year Seminar 01.103.

Lectures three hours a week.

Economics 43.357 ★

Introduction to Industrial Relations

An introduction to industrial relations covering such topics as: industrial relations systems, the functioning of trade unions, collective bargaining in Canada and Canadian public policy in industrial relations. (Also listed as Business 42.317 ★.)

Prerequisite: Economics 43.100 or First-Year Seminar 01.103.

Lectures three hours a week.

Economics 43.360 ★

Topics in International Economics

Possible topics include theory and policy in international trade, finance, investment and development. Intended for students planning to take only 0.5 credit in international economics at the 300-level.

Precludes additional credit for Economics 43.361 ★, 43.362 ★, 43.461 ★, and 43.462 ★.

Prerequisite: Economics 43.100 or First-Year Seminar 01.103, or permission of the Department.

Lectures three hours a week.

Economics 43.361 ★

Introduction to International Trade

An extension of the basic principles of economics to international trade. Topics covered include the theory of international specialization, tariffs and other barriers to trade, trade liberalization and economic integration, international movements of labour and capital, trade and development.

Precludes additional credit for Economics 43.360 ★ and 43.461 ★.

Prerequisite: Economics 43.100 or First-Year Seminar 01.103.

Lectures three hours a week.

Economics 43.362 ★

International Monetary Problems

A discussion of the theory and institutions of the international monetary system, and the related balance of payments problems of nation states.

Precludes additional credit for Economics 43.360 ★ and 43.462 ★.

Prerequisite: Economics 43.100 or First-Year Seminar 01.103.

Lectures three hours a week.

Economics 43.363 ★

Introduction to Economic Development

A discussion of the principles of economic development. Application to the problems of the developing countries.

Prerequisite: Economics 43.100 or First-Year Seminar 01.103.

Lectures three hours a week.

Economics 43.364 ★

Development Planning and Project Evaluation

An Introduction to the tools used in the planning and evaluation of development projects. Topics include the theory, application, strengths and limitations of cost-benefit analysis and competing approaches, and an examination of project evaluation techniques.

Prerequisite: Economics 43.100 or First-Year Seminar 01.103.

Lectures three hours a week.

Economics 43.367 ★

Monetary and Financial Institutions

This course examines the behaviour of financial intermediaries and institutions, such as the Bank of Canada, banks and trust companies, and regulatory bodies such as the Canada Deposit Insurance Corporation and the Superintendent of Financial Institutions.

Prerequisite: Economics 43.100 or First-Year Seminar 01.103.

Lectures three hours a week.

Economics 43.370 ★

The Economics of Transition

The transition from state ownership and central planning to mixed ownership structure with resource allocation by market mechanisms. "Classical socialism" is criticized and the processes of transition in countries of Central and Eastern Europe, the former Soviet Union and Asia are compared.

Precludes additional credit for Economics 43.371 ★ and 43.372 ★.

Prerequisite: Economics 43.100 or First-Year Seminar 01.103.

Lectures three hours a week.

Economics 43.380 ★

Topics in Canadian Economic Policy

Economic analysis applied to selected policy areas, issues or institutions. One or more of the following topics may be dealt with: decision-making by bureaucratic institutions, policy problems arising from poverty, the economics of natural resources and pollution, urban economics.

Prerequisite: Economics 43.100 or First-Year Seminar 01.103.

Lectures three hours a week.

Economics 43.385 ★

The Economics of Natural Resources

This course is concerned with the application of economic analysis to questions concerning natural-resource use, management and conservation, as well as market failures and environmental effects. Policy problems relating to natural resources are discussed.

Prerequisite: Economics 43.100 or First-Year Seminar 01.103.

Lectures three hours a week.

Economics 43.386 ★

Environmental Economics

Microeconomic analysis of environmental issues. Frameworks for measuring environmental costs and benefits. The efficiency of alternative pollution control policies. Applications include air and water pollution and global environmental problems such as ozone depletion and global warming.

Prerequisites: Economics 43.100 or First-Year Seminar 01.103, or Engineering 91.380 ★.

Lectures three hours a week.

Economics 43.404 ★

Operations Research I

Linear programming, duality, sensitivity analysis, transportation and network problems. Both theory and a wide range of applica-

tions are studied.

Precludes additional credit for Business 42.230 ★ and Mathematics 69.381 ★.

Prerequisites: Mathematics 69.109 ★ and 69.119 ★ (grade of C- or better in each course).

Lectures three hours a week.

Economics 43.405 ★

Operations Research II

Dynamic programming, inventory models, queuing, simulation, non-linear programming. (Also listed as Business 42.435 ★.)

Prerequisites: Economics 43.404 ★, or Business 42.230 ★, or Mathematics 69.381 ★, and Economics 43.220 (grade of C- or better) or Mathematics 69.267 ★ (grade of C- or better).

Lectures three hours a week.

Economics 43.406 ★

Economics of Uncertainty and Information

Uncertainty, imperfect information and asymmetric information in the allocation of resources and the performance of markets and alternative co-ordinating mechanisms.

Prerequisites: Economics 43.220 or Mathematics 69.266 ★ and 69.267 ★, and Economics 43.202 ★, with a GPA of 4.0 or better on these prerequisites.

Lectures three hours a week.

Economics 43.407 ★

Statistical Decision Theory

Bayesian and classical approaches to decision-making under uncertainty for individuals and firms.

Precludes additional credit for Business 42.436 ★.

Prerequisite: Economics 43.220 or Mathematics 69.266 ★ and 69.267 ★ (grade of C- or better).

Lectures three hours a week.

Economics 43.408 ★

Advanced Corporate Finance

An in-depth examination of some of the major theoretical issues in corporate finance. This course requires analyses and presentations of both articles from the finance literature and case studies. (Also listed as Business 42.450 ★.)

Prerequisite: Economics 43.350 ★ (grade of C- or better).

Lectures three hours a week.

Economics 43.410 ★

Finance and Capital Markets

Analysis of Canada's financial markets with reference to differing classes of institutional lenders and borrowers; relationships of non-bank financial intermediaries to the banking system, regulatory agencies and the public; impact of these institutions on corporate financial policy and access to foreign capital markets. (Also listed as Business 42.453 ★.)

Prerequisites: Economics 43.202 ★, 43.203 ★, 43.212 ★, and 43.220 or

Mathematics 69.267 ★ (a grade of C- or better is required in each course.)

Lectures and seminars three hours a week.

Economics 43.411 ★

Investment Management

Analysis of investment requirements for individuals and institutional investors: liquidity, risk and return; portfolio design, construction, management and control; performance measurement; capital market theory. (Also listed as Business 42.452 ★.)

Prerequisite: Economics 43.351 ★ (grade of C- or better).

Lectures three hours a week.

Economics 43.415

History of Economic Thought

The crucial achievements in economic theory and doctrine in the nineteenth and twentieth centuries are studied. Special emphasis is

given to the interrelationship between the social environment and economic thought, especially to the role of economics in the development of the national state and international institutions. Also offered at the graduate level, with additional or different requirements, as Economics 43.521 and 43.522, for which additional credit is precluded.

Prerequisite: Economics 43.202 ★, 43.203 ★, 43.212 ★ and 43.213 ★, (with an average grade of C- or better), or permission of the Department.

Lectures and seminars three hours a week.

Economics 43.420 ★

Microeconomic Theory

Theory of individual economic behaviour, theory of exchange and production, general equilibrium, alternative theories of pricing, allocation and distribution. Elementary tools of mathematics are employed in the exposition of most topics.

Prerequisites: Economics 43.202 ★ and 43.203 ★, with an average grade of C+ or better, 43.240 ★ (with a grade of C- or better) and 43.220 (43.220 may be taken concurrently with 43.420 ★).

This course is required for students in the Honours program in Economics.

Lectures three hours a week.

Economics 43.421 ★

Macroeconomic Theory

Major controversies in macroeconomic theory. Topics such as: determination of national income, employment, price level and interest rates; commodity, labour and asset markets; fiscal and monetary stabilization policy.

Prerequisites: Economics 43.212 ★ and 43.213 ★, with an average grade of C+ or better, 43.240 ★ (with a grade of C- or better) and 43.220 (43.220 may be taken concurrently with 43.421 ★).

This course is required for students in the Honours program in Economics.

Lectures three hours a week.

Economics 43.425 ★

Advanced Economics of Information and Media

The economics of information production, its distribution through broadcasting, publishing or the Internet, its exchange through telephone and e-mail networks, its use in private and public organizations. An analysis of telecommunications, broadcasting, copyright, privacy and Internet policy.

Precludes additional credit for Economics 43.320 ★.

Prerequisites: Economics 43.201 ★ or 43.202 ★ and 43.203 ★ (grade of C- or better in each course)

Lectures three hours a week.

Economics 43.426 ★

Topics in North American Economic History

An examination of methodology applicable to the analysis of economic history. Intensive examination of selected topics in North American economic history.

Prerequisites: Economics 43.202 ★, 43.203 ★, 43.212 ★ and 43.213 ★, (with an average grade of C- or better on these prerequisites), or permission of the Department.

Lectures three hours a week.

Economics 43.427 ★

Topics in European Economic History

An examination of methodology applicable to the analysis of economic history. Intensive examination of selected topics in European economic history.

Prerequisites: Economics 43.202 ★, 43.203 ★, 43.212 ★ and 43.213 ★, (with an average grade of C- or better on these prerequisites), or permission of the Department.

Lectures three hours a week.

Economics 43.431 ★

Industrial Organization I - Theory and Evidence

An examination of various theoretical and empirical studies of firm and market organization with emphasis on the pricing, advertising, investment and locational behaviour of firms in imperfectly competitive markets.

Precludes additional credit for Economics 43.330 ★, and 43.430.

Prerequisites: Economics 43.202 ★ and 43.203 ★, or 43.201 ★ (with an average grade of C- or better on these prerequisites).

Lectures three hours a week.

Economics 43.432 ★

Industrial Organization II - Policy and Applications

This course extends the theoretical material developed in Economics 43.431 ★ and applies it to examine public policies toward business in Canada and in other market economies with emphasis on policies relating to regulation, competition, and innovation.

Precludes additional credit for Economics 43.430.

Prerequisite: Economics 43.431 ★.

Lectures three hours a week.

Economics 43.436 ★

Labour Economics

The application of price theory is applied to the labour market. Topics include models of labour supply and labour demand, human capital and the economics of education and unions and their impact on the labour market.

Also offered at the graduate level, with additional or different requirements, as Economics 43.537, for which additional credit is precluded.

Precludes additional credit for Economics 43.435.

Prerequisites: Economics 43.202 ★ or Economics 43.201 ★ (with a grade of C- or better), or permission of the Department.

Lectures three hours a week.

Economics 43.439 ★

Applied Industrial Economics

This course examines the empirical application of microeconomics, with special emphasis on the Canadian economy. Topics include: consumer demand, firm production and investment, and industrial and trade structure.

Prerequisites: Economics 43.202 ★, 43.203 ★, and 43.220, (with a grade of C- or better on these prerequisites).

Lectures three hours a week.

Economics 43.441 ★

Public Sector Economics: Taxation

A discussion of the theory of taxation and an examination of empirical attempts to quantify the theory. Some topics of current interest, such as the redistribution of income in Canada and tax reform are examined.

Precludes additional credit for Economics 43.347 ★.

Prerequisites: Economics 43.202 ★ and 43.203 ★, or 43.201 ★, (with an average grade of C- or better on these prerequisites).

Lectures three hours a week.

Economics 43.442 ★

Public Sector Economics: Expenditures

A discussion of the theory of government expenditures and an examination of empirical attempts to quantify the theory. Some topics of current interest, such as expenditures and grants in the Canadian federalism are examined.

Precludes additional credit for Economics 43.348 ★.

Prerequisites: Economics 43.202 ★ and 43.203 ★, or 43.201 ★, (with an average grade of C- or better on these prerequisites).

Lectures three hours a week.

Economics 43.445 ★

Welfare Economics

An examination of contemporary welfare economics and its appli-

cations. Also offered at the graduate level, with additional or different requirements, as Economics 43.545, for which additional credit is precluded.

Prerequisites: Economics 43.202 ★ and 43.203 ★, or 43.201 ★, (with an average grade of C- or better on these prerequisites).

Lectures and seminars three hours a week.

Economics 43.446 ★

Economic Dynamics: Growth

An examination of modern steady equilibrium economic growth encompassing neoclassical, neo-Keynesian and neo-Ricardian theories of growth and accumulation. The theories of money and capital (and controversies) are examined in a growth context. Some discussion of optimum saving and accumulation is also included. Also offered at the graduate level, with additional or different requirements, as Economics 43.552, for which additional credit is precluded.

Prerequisites: Economics 43.202 ★, 43.203 ★, 43.212 ★ and 43.213 ★, (with an average grade of C- or better on these prerequisites).

Lectures and seminars three hours a week.

Economics 43.447 ★

Project Evaluation

An analytic treatment of the principles of project evaluation and their applications. Also offered at the graduate level, with additional or different requirements, as Economics 43.547, for which additional credit is precluded.

Prerequisite: Economics 43.420 ★ with a grade of C+ or better.

Lectures three hours a week.

Economics 43.451 ★

Economic Dynamics: Business Cycles

An analysis of the nature and causes of fluctuations in income, prices and employment. A review of theories of short-run economic dynamics, with particular references to how expectations are formed. Some consideration is given to countercyclical government policies. Also offered at the graduate level, with additional or different requirements, as Economics 43.551, for which additional credit is precluded.

Prerequisites: Economics 43.212 ★ and 43.213 ★, (with an average grade of C- or better on these prerequisites).

Lectures and seminars three hours a week.

Economics 43.457 ★

The Economics of Development

An examination of some theoretical approaches to the economics of development, together with analysis of some economic policy issues of a largely internal character, such as intersectoral investment allocation, income distribution, unemployment, and investment in human development.

Prerequisites: Economics 43.202 ★ and 43.203 ★, or 43.201 ★; and 43.212 ★ and 43.213 ★, or 43.211 ★, (with an average grade of C- or better on these prerequisites).

Lectures three hours a week.

Economics 43.458 ★

International Aspects of Economic Development

An analysis of the international economic policy problems of development in Asia, Africa and Latin America, focusing on international trade, direct foreign investment, technological transfer, regional integration, debt and development financing, and international migration.

Prerequisites: Economics 43.202 ★ and 43.203 ★, or 43.201 ★; and 43.212 ★ and 43.213 ★, or 43.211 ★, (with an average grade of C- or better on these prerequisites).

Lectures three hours a week.

Economics 43.461 ★

International Trade Theory and Policy

International trade theory and its implications for economic policy. Topics such as determinants of trade and specialization, gains from

trade and commercial policy, international factor mobility, growth and development.

Precludes additional credit for Economics 43.360 ★ and 43.361 ★.

Prerequisites: Economics 43.202 ★ and 43.203 ★, or 43.201 ★, (with an average grade of C- or better on these prerequisites).

Lectures three hours a week.

Economics 43.462 ★

International Monetary Theory and Policy

International monetary theory and its implications for economic policy. Topics such as sources of disequilibrium and adjustment in the balance of payments under fixed versus flexible exchange rates, international capital movements, and international monetary reform.

Precludes additional credit for Economics 43.360 ★ and 43.362 ★.

Prerequisites: Economics 43.212 ★ and 43.213 ★, or 43.211 ★, (with an average grade of C- or better on these prerequisites).

Lectures three hours a week.

Economics 43.465 ★

Industrial Relations

Economic analysis of selected industrial relations and labour market policy problems. Topics include unionization, strike activity, the economics of occupational health and safety, pension policy, and the impact of new technology on the labour market.

Precludes additional credit for Economics 43.465.

Prerequisites: Economics 43.201 ★ or 43.202 ★ (with a grade of C- or better); or permission of the Department.

Lectures three hours a week.

Economics 43.467 ★

Monetary Theory I

The foundations of monetary theory. Topics include classical, Keynesian and other money transmission mechanisms; the "optimum quantity of money;" estimates of supply and demand; difficulties of policy implementation in open and closed economies and in a growth context.

Prerequisites: Economics 43.202 ★ and 43.203 ★, or 43.201 ★; and 43.212 ★ and 43.213 ★, or 43.211 ★, (with an average grade of C- or better on these prerequisites).

Lectures three hours a week.

Economics 43.468 ★

Monetary Theory II

A continuation of Economics 43.467 ★. This course analyzes in depth some past and current controversies in monetary theory particularly as they relate to policy issues.

Prerequisite: Economics 43.467 ★.

Lectures three hours a week.

Economics 43.471 ★

National Accounting

Introduction to modern social accounting, including national income and expenditure accounts, input-output accounts, financial flow and national balance sheet accounts. Canadian practice concerning national wealth accounts, price and quantity indices and productivity measures, and the effects of inflation on national accounts.

Prerequisites: Economics 43.202 ★, 43.203 ★, and 43.212 ★, (with an average grade of C- or better on these prerequisites).

Lectures three hours a week.

Economics 43.476 ★

Econometrics I

An introduction to econometric theory and analysis of the classical normal regression model. Topics include estimation methods, hypothesis testing, multicollinearity, autocorrelation, and heteroscedasticity.

Precludes additional credit for Economics 43.485, 43.482 ★, Mathematics 69.353 ★ and 70.355 ★.

Prerequisite: Economics 43.220 or equivalent, (with a grade of C+ or better).

Lectures three hours a week.

Economics 43.477 ★

Econometrics II

An extension of Economics 43.476 ★, Econometrics I. Topics include dummy variables, qualitative and limited dependent variables, and simultaneous equation models. Optional topics include simple expectations models, errors in variables, specification tests and diagnostics checks, distributed lag models, and seemingly unrelated regression models.

Precludes additional credit for Economics 43.485.

Prerequisite: Economics 43.476 ★, or Mathematics 69.353 ★ or 70.355 ★, (with a grade of C- or better).

Lectures three hours a week.

Economics 43.480 ★

Research Seminar in Urban Economics

An enquiry into the internal dynamics of cities and inter-urban relationships primarily through directed research.

Prerequisites: Economics 43.202 ★ and 43.203 ★, or 43.201 ★; and 43.220 or Mathematics 69.266 ★ and 69.267 ★, (with an average grade of C- or better on these prerequisites).

Economics 43.483 ★

Applied Time Series Analysis in Economics and Business

An introduction to basic concepts of time series analysis with emphasis on model building and forecasts in economics and business. Topics include: models for stationary and nonstationary time series, model identification, estimation, computation of forecasts and transfer function models. Also offered at the graduate level, with additional or different requirements, as Economics 43.573, for which additional credit is precluded.

Prerequisites: Economics 43.220 (with a grade of C+ or better), or Mathematics 69.266 ★ and 69.267 ★ (or equivalent), (with an average grade of C+ or better).

Lectures three hours a week.

Economics 43.484 ★

Advanced Topics in Applied Econometrics

Advanced coverage of one or more areas of current interest in applied econometrics. An empirical research project may be required.

Prerequisites: Economics 43.476 ★ and 43.477 ★ (with an average grade of C- or better on these prerequisites).

Lectures three hours a week.

Economics 43.486 ★

Comparative Economic Systems I

This course builds a framework for comparing economic systems, and also considers the interaction between economic and political systems. The traditional Soviet-type economy, industrial policy, and problems of transition receive particular attention. Also offered at the graduate level, with additional or different requirements, as Economics 43.586, for which additional credit is precluded.

Prerequisite: Economics 43.201 ★ or 43.202 ★ (with a grade of C- or better), or permission of the Department.

Lectures three hours a week.

Economics 43.487 ★

Comparative Economic Systems II

A comparison of contemporary economic systems. Such diverse economies as mainland China, Japan, Germany, Sweden, Russia, Taiwan and Hungary may be explored. Also offered at the graduate level, with additional or different requirements, as Economics 43.587, for which additional credit is precluded.

Prerequisite: Economics 43.201 ★ or 43.202 ★ (with a grade of C- or better), or permission of the Department.

Lectures three hours a week.

Economics 43.490

Honours Seminar

This seminar focuses on the use of basic economic analysis in a small number of research topics to be selected by the instructors. A major research paper is required. This seminar is intended for Fourth-year Honours Economics students.

Prerequisites: Economics 43.420 ★ and 43.421 ★ or permission of the Department.

Lectures three hours a week.

Economics 43.493 ★

Tutorial in Economics

An additional tutorial in Economics may be taken subsequent to, or concurrently with Economics 43.490.

Prerequisite: Permission of the Department.

Economics 43.494

Tutorial in Economics

An additional tutorial in Economics may be taken subsequent to or concurrently with Economics 43.490.

Prerequisite: Permission of the Department.

Economics 43.498

Honours Essay

Students taking Honours in Economics may write an Honours essay during their final year. This essay counts for one credit. Students work under an individual faculty adviser.

Prerequisite: Permission of the Department.

Electronics (Engineering)

5170 Mackenzie Building
Telephone: 520-5754
Fax: 520-5708

Academic Administration

Chair, J.S. Wight

Teaching Staff

Professors Emeriti

A.R. Boothroyd, B.Sc., Ph.D. (London) • **M.A. Copeland**, B.Eng. (Manitoba), M.Eng. (Toronto), Ph.D. (Toronto)

Professors

Chong Hon Chan, B.Sc. (National, Taiwan), M.A.Sc., Ph.D. (Waterloo); P.Eng. • **T.A. Kwasniewski**, M.Sc., Ph.D. (Warsaw Technical University), P.Eng. • **Michel Nakhla**, B.Sc. (Cairo), M.Sc., Ph.D. (Waterloo), P.Eng. • **Tom J. Smy**, B.Sc., Ph.D. (Alberta) • **W. Martin Snelgrove**, B.A.Sc., M.A.Sc., Ph.D. (Toronto) • **B.A. Syrett**, B.Eng., M.Eng. (Carleton), Ph.D. (Alberta), P.Eng. • **N. Garry Tarr**, B.Sc., Ph.D. (British Columbia), P.Eng. • **J.S. Wight**, B.Sc. (Calgary), M.Eng., Ph.D. (Carleton), P.Eng.

Associate Professors

J.P. Knight, B.Sc. (Queen's), M.A.Sc., Ph.D. (Toronto) • **R.M. Mason**, B.Sc. (St. Francis Xavier), M.Eng. (Carleton), Ph.D. (Technical University of Nova Scotia) • **Calvin Plett**, B.A.Sc. (Waterloo), M.Eng., Ph.D. (Carleton) • **P.D. van der Puije**, B.Sc. (Kumasi), D.I.C. (Imperial), Ph.D. (London) • **David J. Walkey**, B.Sc., Ph.D. (Calgary), P.Eng. • **Qi-jun Zhang**, B.Eng. (East China Institute), Ph.D. (McMaster)

Assistant Professor

Niall Tait, B.Sc. (Alberta), M.A.Sc. (British Columbia), Ph.D. (Alberta)

Instructor

T.G. Ray, B.Eng., M.Eng. (Carleton), P.Eng.

Distinguished Research Professor

A.R. Boothroyd

Adjunct Research Professors

M.A. Copeland, • **Robert G. Harrison**, • **F.H. Palmer** • **M. Schroter**, Rockwell Semiconductor • **P.C. Strickland**, CAL Corporation • **M.G. Stubbs**, CRC • **V. Szwarc**, CRC • **R.E. Thomas**

The Departments of Electronics and Systems and Computer Engineering offer courses in Communications Engineering, Computer Systems Engineering and Electrical Engineering programs (please see p. 93, p. 95 and p. 96).

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Engineering 97.251 ★

Circuits and Signals

Properties of signals. Basic circuit elements: voltage and current sources. Kirchhoff's laws, linearity, superposition. Thevenin and Norton's theorems. Circuit simplification. AC steady-state analysis: impedance, admittance, phasors, frequency response. Transient response of RL and RC circuits: form of response, initial and final conditions. RLC circuits: resonance.

Prerequisites: Mathematics 69.105 ★ and Physics 75.104 ★ (or 75.101 ★ and 75.102 ★).

Lectures three hours a week, laboratory and problem analysis three hours a week.

Engineering 97.257 ★

Electronics I

Qualitative semiconductor physics, leading to the diode equation. Diode applications. Operational amplifiers and their application in

feedback configurations including active filters. Introduction to bipolar transistors and MOSFETs, biasing and simple circuit applications. Transistor structure of digital logic gates.

Prerequisite: Engineering 97.251 ★.

Lectures three hours a week, laboratory and problem analysis three hours a week.

Engineering 97.267 ★

Switching Circuits

Boolean algebra, gate, combinatorial circuits. DeMorgan notation, sum-of-product and product-of-sum forms. Logic arrays, PLAs and PALs. Flip-flops, latches, sequential circuits, state graphs and state minimization. Counters and controllers. Hazards. Asynchronous sequential circuits, race free assignment, realization. Precludes additional credit for Engineering 94.267 ★/94.367 ★ or 97.367 ★.

Prerequisite: Engineering 97.251 ★ or permission of the Department.

Lectures three hours a week, laboratory three hours alternate weeks.

Engineering 97.315 ★

Basic EM and Power Engineering

Electrostatics and magnetostatics. Solution of Poisson's and Laplace's equations. The Lorenz equation and force. Time varying fields. Magnetic circuits and transformers. DC and AC motors.

Precludes additional credit for Engineering 97.261 ★ or 97.354 ★.

Prerequisites: Mathematics 69.204 ★ and Physics 75.104 ★ (or 75.101 ★ and 75.102 ★).

Lectures three hours a week, laboratory and problem analysis three hours alternate weeks.

Engineering 97.350 ★

Digital Electronics

Digital circuit design using verilog and logic synthesis, the electronic properties of logic gates, electrical interfacing between logic families, asynchronous to synchronous interfacing, clock distribution and timing, VLSI design options. Students implement substantial circuits with field-programmable gate arrays.

Prerequisites: Engineering 97.257 ★ and 97.267 ★.

Lectures three hours a week, laboratory three hours a week.

Engineering 97.359 ★

Electronics II

Introduction to semiconductor devices and ICs. DC, AC and switching properties of BJTs. Linear amplifiers; bandwidth considerations; two-port analysis. Large signal amplifiers; power amplifiers; transformerless circuits. Feedback and operational amplifiers; gain, sensitivity, distortion and stability. Filter design. Oscillators.

Prerequisite: Engineering 97.257 ★.

Lectures three hours a week, laboratory three hours a week.

Engineering 97.365 ★

Electrical Engineering

DC circuits: elements, sources, analysis. Single phase AC circuits: phasors, RLC circuits, real and reactive power, impedance, network analysis, three phase systems. Power transformers. DC motors: operation and characteristics. AC motors: single phase and three phase.

Prerequisites: Mathematics 69.105 ★ and Physics 75.104 ★ (or 75.101 ★ and 75.102 ★). Not open to students in Electrical Engineering, Computer Systems Engineering, or Aerospace Stream C.

Lectures three hours a week, problem analysis three hours alternate weeks.

Engineering 97.395 ★

Professional Practice

Presentations by faculty and external lecturers on the Professional Engineers Act, professional ethics and responsibilities, practice within the discipline and its relationship with other disciplines and to society, health and safety, environmental stewardship, principles and practice of sustainable development. Communication skills are emphasized. (Also listed as Engineering 94.395 ★).

Precludes additional credit for Engineering 82.495 ★ and 86.495 ★.

Prerequisite: Third-year registration.

Lectures three hours a week

Engineering 97.398 ★

Physical Electronics

Fundamentals of solid-state physics as applied to semiconductors: energy bands; electrons and holes; doping; carrier transport; recombination. Theory of the pn junction in forward and reverse bias. Application to MOS capacitors, MOSFETs, bipolar junction transistors and photonic devices.

Precludes additional credit for Engineering 97.368 ★.

Prerequisites: Chemistry 65.111 ★, Mathematics 69.204 ★, Physics 75.104 ★ (or 75.101 ★ and 75.102 ★), Electronics 97.257 ★.

Lectures three hours a week, problem analysis three hours alternate weeks.

Engineering 97.399 ★

Electromagnetic Waves

Maxwell's equations and solutions. Wave equations and propagation. Interaction of electromagnetic waves with matter. Photons, basic quantum mechanical transitions. Transmission lines and distributed parameter models for RF. Fiber optic cable and waveguides.

Lasers, PIN diodes, photovoltaic devices and device fabrication.

Prerequisite: Engineering 97.315 ★ or permission of the Department.

Lectures three hours a week, problem analysis three hours alternate weeks.

Engineering 97.452 ★

Microwave Circuits

Introduction to microwave tubes, semiconductor devices, and passive components. Scattering matrix description of microwave junctions. Properties of basic reciprocal and non-reciprocal passive microwave devices. Fundamentals of microwave amplifiers and oscillators. Design of solid-state microwave amplifiers and oscillators.

Prerequisite: Engineering 97.453 ★.

Lectures three hours a week, laboratory three hours alternate weeks.

Engineering 97.453 ★

Radio Frequency Lines and Antennas

Introduction to distributed circuits, travelling and standing waves, reflection coefficient, SWR, impedance transformation, Smith charts. Introduction to transmission lines; coaxial, rectangular waveguide, resonators, optical fibers. Introduction to antennas; gain, directivity, effective area. Introduction to linear arrays.

Prerequisite: Engineering 97.399 ★.

Lectures three hours a week, laboratory three hours alternate weeks.

Engineering 97.454 ★

Avionics Systems

Electromagnetic spectrum. Air data sensing, display. Communications systems. Navigation and landing systems; ground-based, inertial and satellite systems. Airborne radar. Guidance, control for aircraft, autopilots; stability augmentation; active control; sensor requirements; display techniques. Aircraft power systems. Safety systems. Vehicle/systems integration, certification.

Precludes additional credit for Engineering 87.454.

Prerequisite: Fourth-year registration. Not open to students in Electrical Engineering, Computer Systems Engineering, or Aerospace Stream C.

Lecture three hours a week.

Engineering 97.455 ★

Telecommunication Circuits

A course of study of the commonly used circuit components in modern telecommunication systems. Both analog and digital systems are included. The design of the hardware is emphasized. Examples are drawn from broadcasting, telephony and satellite systems.

Prerequisites: Engineering 94.351 ★ and 97.359 ★.

Lectures three hours a week, laboratory three hours alternate weeks.

Engineering 97.456 ★

CAD for Communication Circuits

Basic principles of Computer-Aided Design tools used for analysis and design of communication circuits and systems. Frequency and time-domain analysis. Noise and distortion analysis. Transmission line effects. Sensitivity analysis, and circuit performance optimization. Digital simulation.

Prerequisite: Fourth-year registration.

Lectures three hours a week, laboratory and problem analysis three hours alternate weeks.

Engineering 97.459 ★

Communication Links

Fundamentals; decibel, intermodulation, idB compression, dynamic range, SNR, noise figure, noise temperature, antenna gain, EIRP, G/T. Line-of-sight links; receiver, diversity, fade margin. Satellite links; link calculations, multiple accessing, earth stations. Fiber links, fiber types, sources, detectors, systems.

Prerequisite: Fourth-year registration or permission of the Department.

Lectures three hours a week, laboratory and problem analysis three hours alternate weeks.

Engineering 97.460 ★

Radar and Navigation

Radar: operation, minimum detectable signal, propagation effects. Surveillance Radars: Moving Target indicator and Pulse Doppler operation. Radio Navigation: pulsed and CW operation. Operational systems: Loran C., VOR/DME, TACAN, Global Positioning system. Inertial Navigation. Navigation Co-ordinate Systems. Techniques for determining best estimates of position.

Prerequisite: Engineering 97.453 ★.

Lectures three hours a week.

Engineering 97.461 ★

Microprocessor Systems

Interfacing aspects in microprocessor systems. Microprocessors and bus structures, internal architecture, instruction set and pin functions. Memory interfacing, input-output, interrupts, direct memory accesses, special processors and multiprocessor systems.

Precludes additional credit for Engineering 94.361 ★ and Computer Science 95.306 ★.

Prerequisite: Engineering 94.203 ★ or 94.303 ★ or 94.306 ★ or permission of the Department.

Lectures three hours a week, laboratory three hours alternate weeks.

Engineering 97.469 ★

Integrated Circuit Design and Fabrication

Introduction to nMOS IC design: static logic gates, noise margin, transmission gates, factors influencing switching speed, dynamic logic, input protection, output buffers, circuit simulation with SPICE. Laboratory work includes design and layout of a simple nMOS IC which is fabricated and returned for testing.

Prerequisite: Engineering 97.350 ★.

Lectures three hours a week, laboratory and problem analysis three hours alternate weeks.

Engineering 97.470 ★

Modelling of Integrated Devices

The operation and modelling of integrated semiconductor devices. Topics include: physical models, analytic device models, their limitations and, where appropriate, their implementation in commercial circuit simulators, parameter extraction and numerical simulation.

Prerequisite: Engineering 97.398 ★.

Lectures three hours a week, problem analysis two hours alternate weeks.

Engineering 97.475 ★

Electronic Materials, Devices and Transmission Media

Review of solid-state theory, conductors, semiconductors, superconductors, insulators, and optical and magnetic properties. Devices used in modern high speed electronic and communication systems: transistors, lasers, photodiodes, fiber optics, Josephson junctions. Implications of material properties on fabrication and operation of devices and circuits.

Precludes additional credit for Engineering 94.475 ★.

Prerequisite: Fourth-year registration.

Lectures three hours a week.

Engineering 97.476 ★

Digital Integrated Electronics

Lectures and hands-on experience introduce advanced concepts in digital interfacing and hardware simulation. Industry standard VME bus operation, VHDL programming and simulation, programmable logic devices, memory devices. A modern laboratory supports VME multiprocessing, VHDL modelling and hardware design.

Prerequisite: Engineering 97.350 ★.

Lectures two hours a week, laboratory three hours a week.

Engineering 97.477 ★

Analog Integrated Electronics

Emphasis on integration of analog signal processing techniques in monolithic IC technology. Continuous active filter design. MOS IC technology. OP amp design. Basic sampled data concepts; Z-transform analysis, switched capacitor filters. Noise aspects. Bipolar technology: radio frequency IC design.

Prerequisite: Engineering 97.359 ★.

Lectures three hours a week, laboratory and problem analysis three hours alternate weeks.

Engineering 97.478 ★

Advanced Digital Integrated Circuit Design

VLSI design based on CMOS technology; switching characteristics of CMOS logic circuits; cell libraries; structured design and test, Computer-Aided Design tools, design for testability. Laboratory emphasis on design methods using synthesis from Verilog Code. Prerequisite: Fourth-year registration in Electronics or permission of the Department.

Lectures three hours a week, laboratory and problem analysis three hours alternate weeks.

Engineering 97.496 ★

Special Topics in Electrical and Computer Systems Engineering

At the discretion of the Engineering Faculty Board, a course dealing with selected advanced topics of interest to Electrical and Computer Systems engineering students may be offered. (Also listed as Engineering 94.496 ★.)

Prerequisite: Fourth-year registration.

Lectures three hours a week, laboratory and problem analysis three hours alternate weeks.

Engineering 97.497

Engineering Project

Students are required to select and complete a major project in engineering analysis, design, development or research. The results must be submitted in a comprehensive report with appropriate drawings, charts, bibliography, etc.

Engineering 97.498

Engineering Project

Students are required to select and complete a major project in engineering analysis, design, development or research. The results must be submitted in a comprehensive report with appropriate drawings, charts, bibliography, etc.

English Language and Literature (Arts and Social Sciences)

1812 Dunton Tower
Telephone: 520-2310
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Academic Administration

Chair, L.T.R. McDonald

Supervisor of Graduate Studies, R.L. Hogg

Supervisor of Undergraduate Studies, J.D. Campbell

Teaching Staff

Professors Emeriti

A.M. Beattie, B.A. (Toronto), A.M., Ph.D. (Columbia), D.Litt. (Carleton) • **George B. Johnston**, B.A., M.A. (Toronto), LL.D. (Queen's), D.Litt. (Carleton) • **R.L. McDougall**, B.A. (British Columbia), M.A., Ph.D. (Toronto), D.Litt. (Carleton)

Professors

Donald A. Beecher, M.A. (California), Ph.D. (Birmingham) • **Mary Jane Edwards**, B.A. (Toronto), M.A. (Queen's), Ph.D. (Toronto) • **John J. Healy**, M.A. (Leeds), Ph.D. (Texas) • **Priscilla Walton**, B.A., M.A. (McMaster), Ph.D. (Toronto)

Associate Professors

M. Ian Cameron, B.A., Ph.D. (Toronto) • **John Douglas Campbell**, B.A. (Alberta), Phil.M. (Toronto) • **Brenda J. Carr**, B.A. (Evangel College), M.A. (Northeastern), Ph.D. (Western Ontario) • **Parker Duchemin**, B.A., M.A. (Toronto), Ph.D. (London) • **Barbara Gabriel**, B.A. (Manitoba), M.A. (Minnesota), Ph.D. (London) • **Barbara Carman Garner**, B.A. (New Brunswick), M.A. (Toronto), Ph.D. (London) • **A.W. Heidemann**, B.A., M.A. (St. Louis), Ph.D. (Toronto) • **T.J. Henighan**, B.A. (St. John's, N.Y.), M.Litt., Ph.D. (Durham) • **Robert L. Hogg**, B.A. (British Columbia), Ph.D. (New York at Buffalo) • **Robert G. Laird**, B.A. (British Columbia), M.A., Ph.D. (Yale) • **Christopher Levenson**, B.A. (Cambridge), M.A. (Iowa) • **Robert B. Lovejoy**, A.B. (Albany), M.A. (Kentucky), Ph.D. (Case Western Reserve) • **Lindsay A. Mann**, B.S. (Santa Clara), M.A., Ph.D. (Illinois) • **L.T.R. McDonald**, B.A. (Royal Military College), M.A. (Carleton), Ph.D. (Queen's) • **Kathleen O'Donnell**, B.A. (McGill), M.A. (Western Ontario), Ph.D. (Montréal) • **Enoch D. Padolsky**, B.A. (Manitoba), M.A., Ph.D. (California) • **James Steele**, M.A. (Toronto), Ph.D. (London) • **Alistair Tilson**, M.A. (St. Andrews), B.Litt. (Oxford)

Assistant Professors

Barbara L. Leckie, B.A. (Toronto), M.A., Ph.D. (McGill) • **T.G. Nollet**, B.A. (Saskatchewan), M.A. (Wisconsin), M.Phil. (Waterloo)

Instructor

A. Ruffo, B.A. (Ottawa), M.A. (Windsor)

Adjunct Research Professors

J. Flood • **F. Gildenhuis** • **M. Gnarowski** • **Robert H. MacDonald** • **R.D. Mathews** • **J.H.C. Reid** • **B. Rutland** • **D.J. Wurtele**

Adjunct Professors

V.K. Chari • **K.J. McGillivray** • **A. McLay** • **J. Noonan** • **G.J. Wood**

General Information

In 1998-99 the English Department introduced changes in requirements for its Majors students (both B.A. (Honours) and B.A. programs), as well as introducing a Minor in English. These new program requirements apply to all students, both new and returning. Returning students with questions about their program should contact the Supervisor of Undergraduate Studies.

For a full description of course topics, requirements and readings, consult the Departmental Handbook, published every year in June. The Handbook is available from the Department Office, 1812DT, or on the Web, at www.carleton.ca

Graduation Requirements

In order to graduate, students must fulfill all University graduation regulations (see p. 48), all Faculty regulations including those relating to First-Year Seminars and Breadth requirements (see p. 63), and all Major regulations and requirements, as set out below.

B.A. (Honours) Program

The Honours program consists of 10.0 credits in English:

1. 1.0 credit at the 100-level (18.162 recommended);
2. English 18.230;
3. English 18.282;
4. English 18.334;
5. English 18.352;
6. 5.0 additional credits, at least 2.0 of which must be at the 400-level.

Note: Fourth-year standing is interpreted as the completion of a minimum of 14.0 credits in the Honours program.

Combined B.A. (Honours) Programs

The Combined B.A. (Honours) program consists of 6.0 credits in English:

1. 1.0 credit at the 100-level (18.162 recommended);
2. English 18.230;

3. English 18.282;
4. English 18.352;
5. 2.0 additional credits, 1.0 of which must be at the 400-level.

Combined Honours, English and Journalism

A Combined Honours program in English and Journalism may be arranged for students who are admitted to the School of Journalism and Communication.

Candidates for the degree of Bachelor of Journalism, Combined Honours Journalism and English, take a total of 20.0 credits (20.5 credits if admitted prior to 1995-96). The 6.0 required English credits are the same as for any other Combined Honours program in English.

Candidates for the degree of Bachelor of Arts, Combined Honours English and Journalism, take a total of 20.0 credits (20.5 credits if admitted prior to 1995-96). The 6.0 English credits required for the Combined Honours program must include English 18.498.

B.A. Program

The B.A. program in English consists of a minimum of 6.0 credits in English:

1. 1.0 credit at the 100-level (18.162 recommended);
2. English 18.230;
3. English 18.282;
4. English 18.352;
5. 2.0 additional credits.

Minor in English Language and Literature

The Minor consists of 4.0 credits in English, as follows:

1. 1.0 credit at the 100-level (18.162 recommended);
2. English 18.230;
3. English 18.282;
4. English 18.352.

Academic Standing

In order to continue in the B.A. program, a student must attain a GPA of 4.0 or better in the First-year course in English. A GPA of 4.0 or better must be maintained thereafter in English courses.

Certificate in English Language and Composition

This is an in-service certificate intended primarily for practising teachers and designed to upgrade their knowledge of those areas of language and of writing theory that underlie the new Ontario guidelines and support documents.

Admission requirement: a university degree or teaching certificate.

To receive the Certificate in English Language and Composition, students must meet the following requirements:

1. English 18.295;
2. English 18.297;
3. English 18.495;
4. 2.0 credits chosen from the following: English 18.206, 18.305, Linguistics 29.264★, 29.271★, 29.425, or a course approved by the Department.

Note: The same course cannot be counted towards both a degree and the certificate. If any of the courses required for the certificate have already been taken for a degree, then the student must choose an approved option to replace them. Not all the above-listed courses may be offered in any one year.

Graduate Program

The Department of English Language and Literature offers courses of study leading to the degree of Master of Arts. Students may choose a program consisting of course work and thesis or one consisting of course work and a research essay. For further details consult the Graduate Studies and Research Calendar and the Department's Handbook of Advice for Graduate Students in English.

Restricted-Enrolment Workshops

Students who wish to enrol in the following courses: English 18.200★, English 18.201★, English 18.291★ or English 18.293★, should note the following:

1. Enrolment in these workshop courses is restricted.
2. By August 21, 1999 students interested in either English 18.291★ or 18.293★ must submit a portfolio of work. Further information about these courses may be obtained from the Department.
3. A list of students admitted into these courses will be posted in the Department on August 30, 1999.
4. During the Fall registration period, all applicants should register in an alternative course or courses to assure themselves that they are in the number of courses they wish to take, in the event they are not admitted to a workshop.

Reading Lists

Detailed reading lists will be available from the Department of English Language and Literature (1812 Dunton Tower) after May 31. If you are out of town and want a copy of a reading list please send a stamped self addressed envelope to: Book List, English Department, Carleton University, 1125 Colonel By Drive, Ottawa, Ontario K1S 5B6, or consult the Web at www.carleton.ca.

Courses of Interest to Students in Other Disciplines

The Department offers a number of courses of special interest to students outside the English programs, such as English 18.100; 18.101; 18.105; 18.203; 18.206; 18.208; 18.212★; 18.217★; 18.264; 18.290★; 18.292; 18.296; 18.334; 18.394.

Requirement for Breadth, for students in B.A. or B.A.(Honours) degrees:

Category for Breadth	Courses in this unit
The temporal dimension of human societies, analyzing times before the present era or societies other than our own	18.230, 18.334
The artifacts of the imagination in literature and/or other forms, or that addresses the life of the imagination and culture.	All English courses not listed in any other category
The understanding of social, technological and/or natural processes and the ways in which that understanding is obtained in science and social science.	
Matters of human values, ethics and social responsibilities	

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

First-Year Seminar in English 01.104

Survey of English Literature

Historical study of selected authors and works from all periods of British Literature. Communication skills are emphasized. Limited enrolment.

Precludes additional credit for English 18.100.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar in English 01.105

Writing and Language

The essay and essay writing. Communication skills are emphasized. Limited enrolment.

Precludes additional credit for English 18.105.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar in English 01.106

Twentieth-Century Literature

Selected authors and works from twentieth-century literature. Recommended for English majors. Limited enrolment.

Precludes additional credit for English 18.162.

Prerequisite: Normally restricted to students entering the First year of the B.A. program.

Seminars three hours a week.

English 18.100

English Literature from Chaucer to T.S. Eliot

A study of significant works of English literature from the fourteenth to the twentieth centuries, presented as a general historical survey.

Precludes additional credit for First-Year Seminar 01.104.

Lectures three hours a week.

English 18.101

English and Continental Texts

A study of works by English and continental writers. The list of authors to be read usually includes Dante, Boccaccio, Chaucer, Shakespeare, Byron, Flaubert, Tolstoy, Ibsen, and O'Casey. Consult the instructor or the Department for complete reading lists. The continental texts are read in translation.

Lectures three hours a week.

English 18.105

Writing and Language

This course seeks to improve the writing of students from all disciplines through a study of the principles of logic, grammar, and rhetoric, and through the application of those principles in frequent writing assignments.

Precludes additional credit for First-Year Seminar 01.105.

English 18.162

Twentieth-Century Literature

An introduction to literary study, examining the poetry, drama, and fiction of the twentieth century, against the background of the social, cultural, and artistic issues that have determined the concerns of its writers. This course is recommended for English Honours and B.A. students.

Precludes additional credit for First-Year Seminar 01.106.

Lectures three hours a week.

English 18.200 ★

Theatre Workshop I

A course dealing with the rudiments of theatrical performance: voice, movement, improvisation, interpretation. Exercises are based upon examples drawn from the classic and contemporary repertoires. **Note:** Enrolment is restricted. See Restricted-Enrolment Workshops.

Prerequisite: A 100-level credit in English, or Second-year standing.

English 18.201 ★

Theatre Workshop II

A course dealing with techniques of characterization, principles of ensemble performance, scene analysis for actors and directors, styles of performance. Exercises are based upon examples from the classic and contemporary repertoires.

Note: Enrolment is restricted. See Restricted-Enrolment Workshops.

Prerequisite: English 18.200 ★, or permission of the Department.

English 18.203

Introduction to the Novel in English

A historical and critical study of the novel from its beginnings in the eighteenth century to the present. Twelve to fifteen novels are studied.

Precludes additional credit for English 18.303.

Prerequisite: A 100-level credit in English, or Second-year standing.

Lectures three hours a week.

English 18.206

Children's Literature

A historical and critical study of children's literature. The course introduces students to critical analysis and assessment of a number of acknowledged classics of children's literature.

Prerequisite: A 100-level credit in English, or Second-year standing.

Lectures two hours a week.

English 18.208

Myth and Symbol

A study of myth and its appearance in literature. The course explores the great myths that gave form to man's search for meaning, and that still strike a deep response in the psyche. A wide range of texts is used to demonstrate the nature and vitality of myth in both its non-literary and literary forms.

Prerequisite: A 100-level credit in English, or Second-year standing.

Lectures three hours a week.

English 18.209

Greek and Latin Literary Genres

A study through English translations of the various genres of Greek and Latin literature, especially those which influenced later European writing: epic, drama, the ode, pastoral poetry, satire. (Also listed as Classical Civilization 13.209.)

English 18.212 ★

Comedy and Satire

A critical examination of the comic and satiric in English literature through a study of representative plays, novels and short stories. The theory of comedy and satire is examined in relation to the texts: types, techniques, and themes.

Precludes additional credit for English 18.202.

Prerequisite: A 100-level credit in English, or Second-year standing.

Lectures three hours a week.

English 18.215 ★

History of the Language

A course on the nature and development of the sounds, grammar, and spelling of the English language, together with some study of its cultural and stylistic evolution.

Precludes additional credit for English 18.205.

Prerequisite: A 100-level credit in English, or Second-year standing.

Lectures three hours a week.

English 18.217 ★

Literature and the Sciences

A course concentrating on certain points of intersection between literature and science, using texts from various periods and genres. Precludes additional credit for English 18.207.

Prerequisite: A 100-level credit in English, or Second-year standing. Lectures three hours a week.

English 18.230

British Literature: Chaucer to Swift

A study of major authors from Chaucer to Swift.

Prerequisite: A 100-level credit in English.

Lecture three hours a week.

English 18.262 ★

Literature of Ireland

Selected writers of modern Ireland.

Precludes additional credit for English 18.362.

Prerequisite: A 100-level course in English, or Second-year standing.

Lecture three hours a week.

English 18.264

Modern Drama

The study of drama from the late nineteenth century to the present.

Precludes additional credit for English 18.364.

Prerequisite: A 100-level credit in English, or Second-year standing.

Lectures three hours a week.

English 18.266 ★

Literature of Scotland

Selected writers of modern Scotland.

Precludes additional credit for English 18.392.

Prerequisite: A 100-level credit in English, or Second-year standing.

Lecture three hours a week.

English 18.268

Forms and Conventions of the Cinema

This course examines the forms, structures and stylistic conventions of the cinema. Attention is given to the development of a critical idiom suited to the description, analysis and evaluation of film. (Also listed as Film Studies 19.268.)

Prerequisite: Film Studies 19.100, or a 100-level credit in English.

Three hours lecture and screening, one hour lecture.

English 18.272

Introduction to American Literature

An introduction to the major authors and traditions of American literature from its beginnings to the present.

Prerequisite: A 100-level credit in English, or Second-year standing.

Lectures three hours a week.

English 18.282

Canadian Literature

A survey of the development of Canadian literature in English from its nineteenth-century beginnings to the present.

Prerequisite: A 100-level credit in English, or Second-year standing.

Lectures three hours a week.

English 18.288

Contemporary English-Canadian and French-Canadian Literature

This course, which is offered by faculty members from the English and French Departments, provides a general introduction to and comparison of the two major literatures of Canada. Lectures are given in both English and French. Students are encouraged to use the French language for self-expression but need not do so. (Also listed as Canadian Studies 12.288 and French 20.288.)

Precludes additional credit for English 18.188.

Prerequisite: A 100-level credit in English, or Second-year standing.

Lectures three hours a week.

English 18.290 ★

Literature of the Self

A study of the forms, themes, and meaning of autobiographical literature. Attention is paid to the history of autobiographical writing and to the autobiography as a social document, but the main focus of the course is on autobiography as part of the modern search for the self.

Prerequisite: A 100-level credit in English, or Second-year standing. Lectures three hours a week.

English 18.291 ★

Poetry Workshop

A workshop involving regular assignments in writing poetry and practical criticism based on this work.

Note: Enrolment is restricted. See Restricted-Enrolment Workshops.

Precludes additional credit for English 18.291.

Prerequisites: A 100-level credit in English and permission of the Department.

Workshop two hours a week.

English 18.292

Women and Literature

An exploration of the feminine perspective in literature as well as the changing role of women in society. A theoretical survey of relevant issues provides a general framework for the course; the main focus, however, is on selected literary texts. Both women authors and the feminine role in works of literature and in the society that produced them are studied.

Prerequisite: A 100-level credit in English, or Second-year standing.

Lectures three hours a week.

English 18.293 ★

Fiction Workshop

A workshop involving regular assignments in writing prose fiction and practical criticism based on this work.

Note: Enrolment is restricted. See Restricted-Enrolment Workshops.

Precludes additional credit for English 18.293.

Prerequisites: A 100-level credit in English and permission of the Department.

Workshop three hours a week.

English 18.294

Drama to the Nineteenth Century

A study of selected significant plays from the classical to the modern period of world drama, including classical, medieval, renaissance, Restoration, and modern drama.

Precludes additional credit for English 18.304.

Prerequisite: A 100-level credit in English, or Second-year standing.

Lectures three hours a week.

English 18.295 ★

Introduction to the English Language

The sound system, vocabulary, syntax, and grammar of English.

Prerequisite: Second-year standing.

Lectures three hours a week.

English 18.296 ★

The Writer, Literature, and Society

An examination of the roles adopted by the writer in relation to society, either as apologist, social critic, satirist, moralist, visionary, or myth-maker. Texts are chosen from a wide variety of historical periods, but the main focus is on the writer in the modern world.

Precludes additional credit for English 18.296.

Prerequisite: A 100-level credit in English, or Second-year standing.

Lectures three hours a week.

English 18.297

Writing: Theory and Practice

The process of writing in theory and practice. Readings and discussions focus on the nature of the composing process; the

development of writing abilities from the elementary years to maturity; the interrelationships between thinking and writing; strategies for encouraging growth in writing. (Also listed as Linguistics and Applied Language Studies 29.340.)

Precludes additional credit for Linguistics and Applied Language Studies 29.247.

Prerequisite: Second-year standing, or enrolment in either of the Certificate Program in English Language and Composition or the CTESL program.

English 18.300

Literary Criticism from Aristotle to the Present

Problems and questions in literary criticism.

Prerequisite: English 18.230, or permission of the Department.

Lectures three hours a week.

English 18.302 ★

Contemporary Literary Theory

A study of contemporary approaches to critical analysis: phenomenology, hermeneutics, reception theory, structuralism, semiotics, feminist criticism, dialectical criticism, post-structuralism, and deconstruction.

Precludes additional credit for English 18.302.

Prerequisite: Third-year standing, or permission of the Department.

Lectures three hours a week.

English 18.305 ★

Style, Imagination, and Judgment

An examination of the nature of good and bad writing. The category of imagination as a criterion for judging prose. Conditions favourable to the production of good writing. The cultural effects of bad writing.

Precludes additional credit for English 18.305.

Prerequisite: Third-year standing, or enrolment in the Certificate program in English Language and Composition.

Lectures three hours a week.

English 18.312 ★

Old English

A study of Old English language and literature, including grammar and phonology, and translation of selections of Old English prose and poetry.

Precludes additional credit for English 18.312.

Prerequisite: A 100-level credit in English, or permission of the Department.

Lectures three hours a week.

English 18.322 ★

Chaucer and the Literature of Medieval England

A study of Chaucer's works and of the English language and literature between the Norman conquest and the fifteenth century.

Precludes additional credit for English 18.322.

Prerequisite: English 18.230 or permission of the Department.

Lectures three hours a week.

English 18.330

British Literature from the Renaissance to the Romantics

A study of major authors from More to Wordsworth.

Precludes additional credit for English 18.230.

Prerequisite: Enrolment in the B.Humanities program.

Lecture and seminar three hours a week.

English 18.332 ★

Renaissance Literature

A study of the great age of English literature. Poetry and prose from Wyatt and More to Donne and Milton are considered, representing such literary movements as Christian humanism, classicism, and metaphysical literature.

Precludes additional credit for English 18.332, 18.337 and 18.338.

Prerequisite: English 18.230, or permission of the Department.

Lectures three hours a week.

English 18.334

Shakespeare and the Drama of His Contemporaries

Selected plays by Shakespeare and his contemporaries.

Precludes additional credit for English 18.236.

Prerequisites: A 100-level course in English and Second-year standing, or permission of the Department.

Lecture three hours a week.

English 18.342 ★

Eighteenth-Century Literature

A detailed study of authors and movements of the period 1660 to 1780.

Precludes additional credit for English 18.242 and 18.342.

Prerequisite: English 18.230, or permission of the Department.

Lectures three hours a week.

English 18.352

British Literature: The Romantics and The Victorians

A study of major writers of the nineteenth century.

Prerequisite: English 18.230, or permission of the Department.

Lectures three hours a week.

English 18.353 ★

The Novel from Dickens to Conrad

A study of the English novel from the High Victorian period of Dickens, Thackeray, and Eliot to World War I.

Precludes additional credit for English 18.253 and 18.353.

Prerequisites: Third-year standing and a 100-level credit in English, or permission of the Department.

Lectures three hours a week.

English 18.361 ★

Twentieth-Century Poetry

An introduction to the poetry of Great Britain, the United States, and Canada, in the twentieth century.

Precludes additional credit for English 18.361.

Prerequisites: Third-year standing and a 100-level credit in English, or permission of the Department.

Lectures three hours a week.

English 18.363 ★

Twentieth-Century British Fiction

A study of twentieth-century British fiction. The specific authors may vary from year to year. Consult the Department's reading lists.

Precludes additional credit for English 18.363.

Prerequisites: Third-year standing and a 100-level credit in English, or permission of the Department.

Lectures three hours a week.

English 18.371 ★

American Poetry

A study of twentieth-century American poetry to the 1970s. Attention is given to poetic movements and influences.

Precludes additional credit for English 18.371.

Prerequisites: Third-year standing and a 100-level credit in English, or permission of the Department.

Lectures three hours a week.

English 18.373 ★

American Fiction

A study of the American novel to the present. Attention is given to theories of fiction, movements and influences.

Precludes additional credit for English 18.373.

Prerequisites: Third-year standing and a 100-level credit in English, or permission of the Department.

Lectures three hours a week.

English 18.381 ★

Canadian Poetry

A study of the development of poetry in Canada through selected poets. Authors studied will include Layton, Souster, Dudek, Birney, Purdy, Atwood, Jones, Kroetsch, MacEwen, Ondaatje, Webb, Bowering, Marlatt, Nichol, Wah.

Precludes additional credit for English 18.381.

Prerequisite: English 18.282, or permission of the Department.
Seminar two hours a week.

English 18.383 ★

Canadian Fiction

A study of selected Canadian novels and the development of Canadian fiction.

Precludes additional credit for English 18.383.

Prerequisite: English 18.282, or permission of the Department.
Seminar three hours a week.

Topics or courses at the 400-level change from year to year. Consult the English Department's Undergraduate Studies in English Course Guide for topics offered in 1999-2000. The guide is available from the Department of English after April 1st.

English 18.400 ★

Studies in Literary Theory and Criticism

A study of a selected topic in literary theory and criticism.

Precludes additional credit for English 18.400.

Prerequisite: Fourth-year standing in Honours English, or permission of the Department.
Seminar two hours a week.

English 18.401 ★

Studies in Poetry

A study of a selected topic in Victorian British poetry.

Prerequisite: Fourth-year standing in Honours English, or permission of the Department.

English 18.403 ★

Studies in the Novel

A seminar for the study and discussion of the art of the novel as exemplified by major works of fiction. Study includes varieties of form and pattern, modes of narration, imagery and symbolism, realism, and naturalism.

Precludes additional credit for English 18.403.

Prerequisite: Fourth-year standing in Honours English, or permission of the Department.
Seminar two hours a week.

English 18.428 ★

Studies in Medieval Literature I

A study of a selected topic in Medieval literature.

Prerequisites: English 18.322 and Fourth-year standing in Honours English or permission of the Department.
Seminar two hours a week.

English 18.431 ★

Studies in Renaissance Literature I

A study of a selected topic in Renaissance literature.

Prerequisite: Fourth-year standing in Honours English; or permission of the Department.
Seminar three hours a week.

English 18.436 ★

Studies in Shakespeare

A seminar for Honours students, concentrating on critical and scholarly approaches to Shakespeare's work.

Prerequisite: Fourth-year standing in Honours English, or permission of the Department.
Seminar three hours a week.

English 18.441 ★

Studies in Restoration and Eighteenth-Century Literature I

A study of a selected topic in Restoration or Eighteenth-Century literature.

Prerequisite: Fourth-year standing in Honours English, or permission of the Department.
Seminar two hours a week.

English 18.447 ★

Studies in Romantic Literature I

A study of a selected topic in Romantic literature.

Precludes additional credit for English 18.448A ★ (if taken in 1990-94).

Prerequisite: Fourth-year standing in Honours English, or permission of the Department.
Seminar two hours a week.

English 18.451 ★

Studies in Victorian Literature

A study of a selected topic in Victorian Literature.

Prerequisite: Fourth-year standing in Honours English, or permission of the Department.
Seminar three hours a week.

English 18.452 ★

Selected Topic in Victorian Literature II

A study of a selected topic in Victorian Literature.

Prerequisite: Fourth-year standing in Honours English, or permission of the Department.
Seminar three hours a week.

English 18.467 ★

Studies in Twentieth-Century British Literature I

A study of a selected topic in British literature of the twentieth century.

Prerequisite: Fourth-year standing in Honours English, or permission of the Department.
Seminar three hours a week.

English 18.468 ★

Studies in Twentieth-Century British Literature II

A study of a selected topic in British literature of the twentieth century.

Prerequisite: Fourth-year standing in Honours English, or permission of the Department.
Seminar two hours a week.

English 18.478 ★

Studies in American Literature I

A study of a selected topic in American literature.

Prerequisite: Fourth-year standing in Honours English, or permission of the Department.
Lectures two hours a week.

English 18.479 ★

Studies in American Literature II

A study of a selected topic in American literature.

Prerequisite: Fourth-year standing in Honours English, or permission of the Department.
Seminar three hours a week.

English 18.482 ★

Studies in Canadian Ethnic Minority Literature

A study of selected works by Canadian ethnic minority writers.

Precludes additional credit for English 18.482.

Prerequisite: Fourth-year standing in Honours English, or permission of the Department.
Seminar three hours a week.

English 18.483 ★

Studies in the Literature of Quebec and English Canada

A study of selected works of the literatures of Quebec and English Canada.

Prerequisites: Fourth-year standing in Honours English, or permission of the Department.
Seminar two hours a week.

English 18.486 ★

Studies in Canadian Literature I

A study of a selected topic in Canadian literature.

Prerequisite: Fourth-year standing in Honours English or permission of the Department.

Seminar three hours a week.

English 18.488 ★

Canadian Writing and the Literatures of the First Nations

This course investigates the dominant discourse about Native People in Canadian writing and the literatures produced by storytellers and writers of the First Nations, from the period of first contact until the present. Texts include a wide range of material from Canadian, Indian, Inuit, and Métis writers.

Precludes additional credit for English 18.488.

Prerequisite: Fourth-year standing in Honours English, or permission of the Department.

Seminar three hours a week.

English 18.490 ★

Studies in Culture and the Text

A course in applied literary theory.

Prerequisite: Fourth-year standing in Honours English, or permission of the Department.

Seminar three hours a week.

English 18.495 ★

Research Seminar in English and Education

Investigation of recent developments in language study, rhetoric, and composition, and studies of the literary imagination and their implications for the teaching of English. This course is chiefly intended for practising or future teachers. It may meet on an irregular schedule. Classes may begin before the first week in September.

Precludes additional credit for English 18.495.

Prerequisite: English 18.295 and 18.297, or permission of the Department.

Seminar two hours a week.

English 18.496 ★

Studies in African or Caribbean Literature

A study of a selected topic in African or Caribbean literature.

Prerequisite: Fourth-year standing in Honours English, or permission of the Department.

Seminar three hours a week.

English 18.497 ★

Studies in Australian and New Zealand Literature or Indian Literature in English

A study of a selected topic in Australian and New Zealand literature or Indian literature in English.

Prerequisite: Fourth-year standing in Honours English, or permission of the Department.

Seminar three hours a week.

English 18.498

Independent Study

A course for independent research and writing, under the supervision of a member of the Department, open to students in the Fourth year of Honours with an A- standing in their English courses. An essay of approximately 10,000 words is the usual written assignment. A written request, outlining the project, with the approval of the supervisor, must be submitted to the co-ordinator by the last day for course changes.

Note: This course may be used to fulfill one of the seminar or 400-level requirements for the Honours degree, but it cannot normally substitute for English 18.230, 18.334 or 18.352. For students in Combined Honours, however, it is considered to be the equivalent of an Honours Essay.

Environmental Science (Science)

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Academic Administration

Director, D.C. Wigfield

Associate Director, I. Munro

Environmental Science Council

G.M. Atkinson (Earth Sciences), **M. Brklacich** (Geography and Environmental Studies), **R.C. Burk** (Chemistry), **C. Burn** (Geography and Environmental Studies), **N. Cappuccino** (Biology), **N. Doubleday** (Geography and Environmental Studies), **L. Fahrig** (Biology), **M.R.L. Forbes** (Biology), **B.R. Hollebone** (Chemistry), **D. Karman** (Environmental Engineering), **D.J. King** (Geography and Environmental Studies), **P. Kruus** (Chemistry), **E.P.C. Lai** (Chemistry), **I.B. Lambert** (Biology), **J. Lundberg** (Geography and Environmental Studies), **F.A. Michel** (Earth Sciences), **J.D. Miller** (Chemistry), **I. Munro** (Earth Sciences), **W. Parker** (Environmental Engineering), **D. Patterson** (Geography and Environmental Studies), **R.T. Patterson** (Earth Sciences), **C. Schröder-Adams** (Earth Sciences), **M.W. Smith** (Geography and Environmental Studies), **M.L. Smith** (Biology), **J.K. Torrance** (Geography and Environmental Studies), **P.J. Weatherhead** (Biology), **D.C. Wigfield** (Chemistry), **D.R. Wiles** (Chemistry), **R.C. Wyndham** (Biology)

General Information

The Environmental Science program at Carleton University is a multi-disciplinary program reflecting the fact that a comprehensive study of the environment requires a knowledge of a number of fundamental scientific disciplines. The program is designed to provide its graduates with wide scientific and ethical training related to environmental issues, and to prepare them for employment in government, industry, or academic positions.

The main program in Environmental Science maintains the interdisciplinary aspect of study for all four years. Minors in Geographic Information Processing (GIP) or in Business are available. In addition, three new programs are available with specialization in one of Biology, Geology, or Chemistry. These programs are designed for those students who wish to focus their studies on these individual fields and are particularly desirable for those who plan to proceed to graduate studies in one of these areas.

Admission Requirements

The requirements are those specified for the B.Sc. Honours degrees for the Faculty of Science.

Graduation

In order to graduate, students must fulfill all University regulations (see p. 48) and all Faculty regulations (see p. 109), in addition to the regulations established by the Environmental Science Committee.

Honours Program

Summary of Program Requirements

1. 2.5 credits in Environmental Science: Environmental Science 62.150★, 62.359★, 62.396★, 62.496;
2. 1.0 credit in Mathematics: Mathematics 69.107★, 69.257★;
3. 3.0 credits in Geology and Geography: Geology 67.105/Geography 45.105, Geology 67.238★ and 67.285★, Geography 45.318★, and 0.5 credit in approved science courses at the 300- or 400-level in Geography;
4. 2.0 credits in Chemistry: Chemistry 65.100, 65.232★, 65.280★;
5. 2.0 credits in Biology: Biology 61.103★ and 61.104★, 61.214★ (or 61.220★), 61.260★;
6. 0.5 credit in Philosophy: Philosophy 32.184★;

7. 2.0 credits appropriate to Environmental Science in a coherent arts or social science sequence (see *Comments Regarding Course Requirements*, a, p. 239) (of which up to 1.0 credit may be chosen from the list of courses otherwise not acceptable as Social Science electives for Science students).

8. 3.5 credits in approved Science courses

9. 1.0 additional credit in approved Science courses at the 400-level;

10. 1.5 credits chosen in consultation with the Program Director; (see *Comments Regarding Course Requirements*, b)

11. 1.0 credit, free elective.

Note: The following will be used to calculate the Major GPA: Environmental Science 62.150★, 62.359★, 62.396★, 62.496, Biology 61.260★, Chemistry 65.280★, Geology 67.238★, 1.0 credit of experimental Science at the 100-level, and all of Program requirements 8, 9, and 10.

Approved Courses for the Science Requirements of the Environmental Science Program

Approved Courses for the Science Requirements of the Environmental Science Program:

Biology 61.201★, 61.202★, 61.220★, 61.304★, 61.311★, 61.314★, 61.325★, 61.331★, 61.335★, 61.351★, 61.361★, 61.362★, 61.364★, 61.365★, 61.381★, 61.391★, 61.413★, 61.414★, 61.416★, 61.419★, 61.430★, 61.463★, 61.469★, 61.481★;

Chemistry: 65.311★, 65.312★, 65.315★, 65.321★, 65.322★, 65.325★, 65.335★, 65.353★, 65.354★, 65.355★, 65.370★, 65.380★, 65.431★, 65.432★, 65.480★;

Computer Science 95.102★, 95.103★, 95.104★, 95.105★, 95.107★; Environmental Science 62.401★;

Geography 45.207★, 45.210★, 45.211★, 45.302★, 45.303★, 45.305★, 45.306★, 45.307★, 45.311★, 45.312★, 45.313★, 45.315★, 45.319★, 45.400★, 45.402★, 45.403★, 45.406★, 45.411★, 45.412★, 45.413★, 45.414★, 45.417★, 45.418★;

Geology 67.223★, 67.225★, 67.228★, 67.231★, 67.236★, 67.244★, 67.321★, 67.323★, 67.385★, 67.386★, 67.419★, 67.423★, 67.424★, 67.425★, 67.484★, 67.485★;

Mathematics 69.117★, 69.207★, 69.259★, 69.358★;

Physics 75.101★, 75.102★, 75.291★, 75.292★;

Engineering 81.201 ★;

Other courses may be substituted with the permission of the Institute.

Comments Regarding Course Requirements

a) The recommended arts/social science sequence should be chosen in consultation with the Program Director. Upper-year courses of interest to students in Environmental Science usually require a First-year prerequisite; therefore this sequence may have to be started in Second year. Suitable sequences can be set up in Economics, Political Science/Law, Human Geography, Sociology, Anthropology, Mass Communication, etc.

b) 1.5 credits can be chosen from any department, but they must be suitable for the program of the individual student. The choice must also be made so that the regulations of the Faculty of Science for the B.Sc. (Honours) degree are met. It is recommended that these courses be chosen in consultation with the Program Director to ensure a proper foundation for the student's specialization and Honours research project.

c) 62.401 ★ can be taken as a course in requirement category 8, 10, or 11.

d) Technology, Society, Environment Studies courses 59.301 ★, 59.302 ★, 59.350 ★, 50.401 ★, 59.402 ★, 59.403 ★, 59.405 ★, 59.406 ★, 59.407 ★) can only be taken as courses in requirements 10 or 11.

e) It is highly recommended that the program include a Computer Science course.

Concentrations

The Environmental Science Committee also offers B.Sc. (Honours) degrees in Environmental Science with concentrations in Biology, Geology or Chemistry.

These concentrations all have the same First year. The Biology and Geology concentrations also have a Second year similar to the basic Environmental Science program.

The Honours Research Project in these concentrations is Environmental Science 62.496. It is expected that the supervisor of the project will be a faculty member of the Department in which the concentration is taken.

Biology Concentration

Program Requirements 1 - 7 and 11 are the same as in the above main program:

Requirements 8, 9, and 10 must contain the following courses (4.0 credits total):

61.201 ★, 61.202 ★, 61.220 ★, 61.304 ★ or 61.311 ★ or 61.233 ★ (2.0 credits total), plus either any two of 61.361 ★ or 61.362 ★ or 61.365 ★ or 61.366 ★, and 61.364 ★, 61.4xx ★ (Ecology focus) or 61.314 ★, 61.413 ★, 61.4xx ★, and one of 61.233 ★ or 61.311 ★ or 61.333 ★ (Microbiology/genetics focus).

Geology Concentration

Program Requirements 1 - 7 and 11 are the same as in the above main program:

Requirements 8, 9, and 10 must contain the following courses (5.5 credits total): 67.223 ★, 67.225 ★, 67.228 ★, 67.321 ★, 67.385 ★, 67.386 ★ (3.0 credits total), plus any four chosen from 67.231 ★, 67.236 ★, 67.323 ★, 67.324 ★, 67.325 ★, 67.423 ★, 67.425 ★, 67.431 ★, 67.432 ★, 67.484, 67.485 ★ (2.0 credits total), and Mathematics 69.117 ★.

Chemistry Concentration

1. 2.0 credits in Environmental Science: 62.150 ★, 62.359 ★, 62.496;

2. 1.0 credit in Mathematics: 69.107 ★, 69.257 ★;

3. 3.0 credits in Geology and Geography: Geology 67.105/Geography 45.105, Geology 67.238 ★ and 67.285 ★, Geography 45.318 ★ and 0.5 credit in approved Science courses at the 300- or 400-level in Geography;

4. 8.0 credits in Chemistry: 65.100, 65.211 ★, 65.212 ★, 65.223 ★, 65.224 ★, 65.232 ★, 65.233 ★, 65.335 ★, 65.353 ★, 65.380 ★, 65.480 ★, 65.4xx ★, plus either 65.321 ★, 65.322 ★, 65.325 ★ (Organic focus), or 65.354 ★, 65.355 ★, 65.2xx or greater (Inorganic focus), or 65.311, 65.315 ★ and Mathematics 69.207 ★ (Physical focus);

5. 2.0 credits in Biology: 61.103 ★, 61.104 ★, 61.260 ★, 61.214 ★;

6. 1.0 credits in Physics: 75.107 ★, 75.108 ★;

7. 0.5 credits in Philosophy: 32.184 ★;

8. 1.5 arts or social science credits appropriate to Environmental Science;

9. 1.0 credit, free elective.

Minor in Geographic Information Processing

A Minor in Geographic Information Processing (GIP) is available to Environmental Science students. See p. 262 for details.

Minor in Business in Environmental Science

A Minor in Business is available to Environmental Science students. See p. 160 for details.

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Environmental Science 62.150 ★

Environmental Science Seminar

The purpose and nature of the program; society's view on the natural and human-modified environment; major environmental issues and their scientific aspects; preparation and presentation of paper and seminars.

Prerequisite: Registration in the Environmental Science Program. Lectures, seminars and workshops four hours a week.

Environmental Science 62.359 ★

Group Project

Major project relating to an issue involving environmental science; effective methods of team research and presentation of group work.

Prerequisite: Registration in Third year of the Environmental Science program or permission of the Program Director. Lectures, seminars and workshops three hours a week.

Environmental Science 62.396 ★

Research Planning

Assists students in preparing a research plan and proposal for their Fourth year Honours project; discussion and workshop experience in the fundamentals of scientific investigation, including use of literature, theory and data, preparation and evaluation of a scientific research proposal.

Prerequisite: Registration in Third year of the Environmental Science program, or an Honours Science program with permission of the Program Director.

Discussion groups and workshops three hours a week.

Environmental Science 62.401 ★

Environmental Science Practicum

Experience in an external agency setting, translating the academic dimension into practical involvement with environmental issues. Requires a final report integrating the placement experience with the student's background knowledge. Graded *Sat/Uns*.

Prerequisite: Registration in Fourth year of the Environmental Science program.

Environmental Science 62.496

Honours Research Project

An independent investigation into an aspect of environmental science supervised by a member of the faculty. Approval of the topic and the research schedule must be obtained from the project supervisor and the program director before the last date for late registration.

Prerequisite: Registration in Fourth year of the Environmental Science program and permission of the Program Director.

Environmental Studies (Arts and Social Science)

Room B349 Loeb Building
Telephone: 520-2561 or 520-2600, ext. 8370
Fax: 520-4301

Academic Administration

Associate Chair and Program Co-ordinator, Nancy C. Doubleday

Members of the Committee: Jay Drydyk (Philosophy), Jared Keil (Sociology and Anthropology), Peeter Kruus (Chair, Technology, Society, Environment Studies), Fiona Mackenzie (Geography and Environmental Studies), Keith Newton (Faculty Representative), Peter Swan (Law), Katherine Teske (Student Representative), Ken Torrance (Geography and Environmental Studies), Paul Van Geel (Environmental Engineering), Don Wigfield (Director, Environmental Science)

General Information

The B.A. program in Environmental Studies is founded on the premise that the social sciences and humanities can make a significant contribution to the study of environmental issues. The program is designed to enable students to develop an interdisciplinary perspective on human interaction with the environment. To this end it introduces students to the range of social, cultural, economic, political, legal and ethical factors affecting human interaction with the environment, while at the same time ensuring they acquire a basic literacy in the physical and biological sciences.

In the course of their studies, students will develop an understanding and appreciation of the environmental consequences of individual and collective human actions and policies. The program will expose students to the approaches of various disciplines to understanding the environment, as well as the differences and inconsistencies between the various approaches. In addition students will be introduced to methods and techniques appropriate for examining environmental questions from a human and social perspective.

The Major in Environmental Studies is offered as both the B.A. (Honours) and B.A. degree.

Honours graduates from this program could be eligible to undertake graduate study in Environmental Studies, as well as Geography, Sociology, Political Science, Legal Studies, Philosophy, or some other discipline. Students who contemplate going on to graduate work should seek appropriate advice on selecting their program electives and options.

Students in Environmental Studies are permitted to take Minors in other disciplines. Students considering Minors are encouraged to plan their programs early and carefully. Minors which may of particular interest to Environmental Studies students include: Geography, Geographic Information Processing and Technology, Society, Environment Studies.

The program is administered by the Department of Geography and Environmental Studies.

Graduation Regulations

In order to graduate, students must fulfill all University graduation requirements (see p. 48), all Faculty requirements including those relating to First-Year Seminars (see p. 63), and all Major regulations and requirements set out below. Note: Environmental Studies students are exempt from Breadth requirements.

B.A. (Honours) Program

For the B.A. (Honours) degree, the Environmental Studies program consists of a total of 12.0 credits, with a core of 8.0 credits

plus 4.0 program electives. The remaining 8.0 credits for the degree are free options. Where a student has been permitted to take both sections of the Practicum, 57.401 ★ and 57.402 ★, one section will be applied to Requirement 11 of the B.A. (Honours) Program; and the second section will be counted toward the Program Electives (Requirement 13).

1. Science 60.101 ★ and 60.102 ★;
2. Philosophy 32.184 ★;
3. Geography 45.102 ★;
4. Environmental Studies 57.200 ★;
5. Science 60.201 ★ and 60.202 ★;
6. One of: Economics 43.220; Geography 45.205 ★ and 45.206 ★, or 45.204; Political Science 47.270; Psychology 49.200; Sociology 53.203;
7. Environmental Studies 57.300 ★;
8. One of: Philosophy 32.284 ★; Law 51.380 ★;
9. Biology 61.216 ★ or 0.5 Science Continuation Credit;
10. Environmental Studies 57.400 ★;
11. Environmental Studies 57.401 ★ or 57.402 ★;
12. Environmental Studies 57.497;
13. 4.0 credits to be chosen from the list of Program Electives (see below). At least 1.5 of these credits must be at the 300-level or above.

B.A. Program

For the B.A. degree, the Environmental Studies program consists of a total of 8.0 credits, with a core of 5.5 credits plus 2.5 program electives. The remaining 7.0 credits for the degree are free options.

1. Science 60.101 ★ and 60.102 ★;
2. Philosophy 32.184 ★;
3. Geography 45.102 ★;
4. Environmental Studies 57.200 ★;
5. Science 60.201 ★ and 60.202 ★;
6. One of: Economics 43.220; Psychology 49.200; Sociology 53.203; Political Science 47.270; Geography 45.205 ★ and 45.206 ★, or 45.204;
7. Environmental Studies 57.300 ★;
8. One of: Philosophy 32.284 ★; Law 51.380 ★;
9. 2.5 credits to be chosen from the list of Program Electives (see below). At least 1.0 of these credits must be at the 300-level or above.

Prerequisites

In choosing optional courses, especially in First year, students should take into account the prerequisite requirements for courses they will be taking in subsequent years. In particular, as preparation for the statistics/methodology course in requirement 6 (see B.A. (Honours) and B.A. program, p. 241), students should include in their First-year course selection an introductory course in at least one of Economics, Sociology, Political Science or Psychology. These courses, along with the introductory course in Law, and an additional 0.5 credit in Geography also serve as prerequisites to many of the courses listed below as Program Electives.

Program Electives

The Environmental Studies major requires a minimum number of Program Electives (see B.A. (Honours) and B.A. program, p. 241). The list of acceptable electives is laid out below. The courses are grouped according to four themes. Students may concentrate their electives within a single theme or distribute them over various themes according to personal interests and career goals. Students should consult the program co-ordinator about a strategy appropriate for their individual goals, especially if these plans include eventual graduate study.

Additional selections may be made from the departments whose courses appear below. Students may also select courses from Chemistry, Physics, Earth Sciences, Architecture or other disciplines which relate to their chosen theme.

Environment, Economy and Development

Biology
61.216 ★

Economics
43.385 ★, 43.386 ★

Environmental Studies
57.290 ★

European and Russian Studies
55.405 ★

Geography
45.211 ★, 45.220 ★, 45.311 ★, 45.318 ★, 45.319 ★, 45.329 ★, 45.336 ★, 45.404 ★, 45.430 ★, 45.443 ★, 45.445 ★

History
24.421

Sociology/ Anthropology
54.206 ★, 56.253 ★, 53.451 ★

Technology, Society, Environment
59.301 ★, 59.302 ★, 59.350 ★, 59.401 ★, 59.402 ★

Environment, Policy and Law

Environmental Studies
57.290 ★

Geography
45.326 ★, 45.404 ★, 45.430 ★

History
24.421

Law
51.205, 51.305 ★, 51.380 ★

Political Science
47.200, 47.402 ★

Sociology
53.348 ★, 53.382 ★, 53.383 ★, 53.440 ★

Technology, Society, Environment
59.301 ★, 59.302 ★, 59.350 ★

Environmental Attitudes and Ethics

Environmental Studies
57.290 ★

Geography
45.230 ★, 45.404 ★, 45.430 ★, 45.431 ★

History
24.421

Philosophy
32.212 ★, 32.284 ★, 32.330, 32.415 ★, 32.416 ★

Sociology/ Anthropology
54.206 ★, 53.348 ★

Technology, Society, Environment
59.301 ★, 59.302 ★, 59.350 ★

Human Population and the Built Environment

Architecture
78.345 ★, 78.392A ★, 76.410 ★, 76.415 ★,

Engineering
82.433 ★

Environmental Studies
57.290 ★

Geography
45.320 ★, 45.370 ★, 45.423 ★, 45.427 ★

History
24.329 ★

Political Science
47.302 ★

Sociology/ Anthropology
53.251 ★, 53.254 ★, 53.260 ★, 54.335 ★, 56.339 ★, 53.451 ★, 53.456 ★

Course Suggestions for Free Options

Biology
61.192 ★

Canadian Studies
12.100, 12.302, 12.402

English Language and Literature
18.296

Geography
45.255 ★, 45.302 ★, 45.319 ★, 45.335, 45.351 ★

History
24.353 ★, 24.434

Law
51.374 ★

Philosophy
32.211 ★

Physics
75.291 ★, 75.292 ★

Political Science
47.303 ★

Religion
34.235

Technology, Society, Environment
59.301 ★, 59.302 ★, 59.350 ★, 59.401 ★, 59.402 ★, 59.407 ★

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Environmental Studies 57.200 ★

Nature and Environmental Studies

Conceptual and practical approaches to understanding nature and the environment, involving descriptive, analytic, investigative and experiential methods. Through reading, participation, research and writing, students should demonstrate an ability to integrate various approaches to environmental awareness and analysis.

Precludes additional credit for Environmental Studies 04.200 ★.

Prerequisite: Second-year standing in the Environmental Studies program or permission of the Environmental Studies Co-ordinator.

Lectures, seminars and field work three hours a week.

Environmental Studies 57.290 ★

Intensive Field Course

Training in specific fields of research or practice related to careers in Environmental Studies. Such training could include environmental education, environmental auditing, environmental assessment, or living resource inventories, for example. Specific topics may change from year to year.

Prerequisite: Second-year standing or higher in Environmental Studies, and permission of the Environmental Studies Coordinator.

Field work for one week (36 contact hours)

Environmental Studies 57.300 ★

Environmental Studies Colloquium

Interactions among complex natural systems, social values and attitudes, and economic, political and legal concerns are explored through invited speakers from various disciplines and agencies addressing specific environmental issues.

Precludes additional credit for Environmental Studies 04.300 ★.

Prerequisite: Third-year standing in Environmental Studies or permission of the Environmental Studies Co-ordinator.

Environmental Studies 57.400 ★

Environmental Studies Seminar

How societal institutions respond to environmental concerns, how the environment is understood by various stakeholders and how environmental priorities may be reflected in social, political and economic decision-making. Interdisciplinary case studies are used.

Precludes additional credit for Environmental Studies 04.400 ★.

Prerequisite: Registration is restricted to students eligible for Fourth-year standing in the B.A. (Environmental Studies) Honours program.

Environmental Studies 57.401 ★

Environmental Studies Practicum I

External agency setting provides the basis for translating academic training into practical involvement with environmental issues. Final report which integrates the placement experience with the student's background knowledge is required. Graded *Sat/Uns*.

Precludes additional credit for Environmental Studies 04.401 ★.

Prerequisite: Registration is restricted to students eligible for Fourth-year standing in the B.A. (Environmental Studies) Honours program, and permission of the Environmental Studies Co-ordinator.

Environmental Studies 57.402 ★

Environmental Studies Practicum II

External agency setting provides the basis for translating academic training into practical involvement with environmental issues. A final report which integrates the placement experience with the student's background knowledge is required. Graded *Sat/Uns*.

Precludes additional credit for Environmental Studies 04.402 ★.

Prerequisite: Restricted to students in the Fourth-year of the Environmental Studies Honours program, and permission of the Environmental Studies Co-ordinator.

Environmental Studies 57.497

Honours Essay in Environmental Studies

Interdisciplinary research essay on an environmental issue, carried out in consultation with a faculty supervisor. The student must consult with the Environmental Studies Co-ordinator in selecting a project and a supervisor.

Precludes additional credit for Environmental Studies 04.497.

Prerequisite: Registration is restricted to students eligible for Fourth-year standing in the B.A. (Environmental Studies) Honours program.

European and Russian Studies (Public Affairs and Management)

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Academic Administration

Director, Joan DeBardeleben

Honours Adviser, Joan DeBardeleben

Teaching Staff

Professor

Joan DeBardeleben, B.A., M.A., Ph.D. (Wisconsin)

Associated Members

J. Laurence Black, B.A. (Mount Allison), M.A. (Boston), Ph.D. (McGill) • **Richard Lee Carson**, M.A. (Minnesota), Ph.D. (Carleton) • **Andrea S. Chandler**, B.A. (Dalhousie), M.A. (Carleton), M.Phil., Ph.D. (Columbia) • **Joan DeBardeleben**, B.A., M.A., Ph.D. (Wisconsin) • **Piotr Dutkiewicz**, LL.M. (Warsaw), Ph.D. (Soviet Academy of Science) • **R. Carter Elwood**, B.A. (Dartmouth), M.A., Ph.D. (Columbia) • **Carl G. Jacobsen**, B.A. (Carleton), M.Phil., Ph.D. (Glasgow) • **Diane O. le Berrurier**, Cands. H.A.A., Cands. Ph.H.S., Lics. H.A.A., Agreg. H.A.A. (Université libre de Bruxelles), M.A., Ph.D. (Chicago) • **A. Lewinson**, M.Sc. (Odessa), M.A. (Ottawa) • **David P. Long**, B.A. (Keele), Ph.D. (London School of Economics) • **M. McMahon**, B.Soc.Sc. (Dublin), M.A., Ph.D. (Toronto) • **G.I. Ozornoy**, M.A. (Leningrad State University, Alberta), Ph.D. (Leningrad Institute of Finance and Economics, Toronto) • **Jeremy T. Paltiel**, B.A. (Toronto), M.A., Ph.D. (California at Berkeley) • **J. Pammett**, B.A., M.A. (Queen's), Ph.D. (Michigan) • **M. Sabanadze**, M.A. (North Ossetia), Ph.D. (Leningrad State) • **Lloyd H. Strickland**, B.A. (John Hopkins), Ph.D. (North Carolina) • **F.A.J. Szabo**, B.A. (Montreal), M.A., Ph.D. (Alberta)

Distinguished Research Professor

Carl H. McMillan, Jr., M.A. (Yale), Ph.D. (John Hopkins)

Adjunct Research Professors

M. Carley • **J.D. Clayton** • **M. Crnobrnja** • **H. Diskin** • **A. Donskov** • **J. Fedorowicz** • **J. Fraser** • **A. Kagedan** • **P. Konecny** • **M. Los** • **M. Opalski** • **P. Roberts** • **R. Sokoloski**

General Information

The Institute of European and Russian Studies offers an interdisciplinary Bachelor of Arts (Honours) program in European and Russian Studies. The curriculum for the program is offered largely through participating departments. Faculty members from a wide range of disciplines participate in the Institute's programs. These include Art History, Business, Economics, Geography, History, International Affairs, Law, Philosophy, Political Science, Sociology, French, German, Italian, Russian, and Spanish. The program involves a core curriculum and the selection of a concentration in one of the following fields: Western Europe, East/Central Europe, or Russian Area studies. Students in the Institute's programs are eligible to apply for study abroad under academic exchanges in Austria, Denmark, England, Finland, France, Germany, Hungary, the Netherlands, Poland, the Russian Federation, Spain, Scotland, and Wales.

The program allows students to focus their studies on a broad range of topics relating to Europe, including European integration, East-West relations, nationality and minority issues, environmental and social policy, social consequences of economic change, public opinion and survey research, NATO enlargement and security policy, the post-communist transition processes in Eastern Europe and the Soviet successor states, and a range of historical topics.

Students participating in the program have at their disposal documents, periodicals, newspapers, and micro-materials on the European countries, and the extensive holdings of the National Library and other specialized libraries in Ottawa. Each year, the Institute organizes a series of public seminars and lectures by invited specialists from outside the University.

In the face of current transformations in Europe, the region has enormous importance in shaping larger global processes and the international balance of power; expanded economic opportunities in the area are also increasing the demand for area specialists. Therefore, a degree in European and Russian Studies provides student with valuable preparation for a career in government service, in business or finance, or in non-governmental and international organizations. Some students find interdisciplinary and language studies an important first step to more specialized training in law, business, or in one of the related academic disciplines.

Students should note that it is possible to combine a B.A. (Honours) degree in European and Russian Studies with a degree in one of several other departments, including Journalism, Political Science, Law, and History.

Graduation Regulations

In order to graduate, students must fulfill all University graduation regulations (see p. 48), all Faculty regulations including those relating to First year Seminars (see p. 63) in addition to all regulations and requirements of the Institute as set out below. The B.A. requirement for Breadth (see p. 63) is modified for students in this Honours program, who must present either 1.0 credit drawn from areas 2 and 4; or 2.0 credits from either area.

Honours Program

The objective of the Honours program is to equip students with indispensable linguistic tools and to provide, through an interdisciplinary approach, an integrated knowledge of the cultures, historical developments and contemporary social, economic and po-

litical systems of the area. The program leads to the degree of Bachelor of Arts with Honours in European and Russian Studies.

Combined Honours Program

A Combined Honours degree between European and Russian Studies and the School of Journalism and Communication is available to students already accepted into the Journalism Honours program.

Course requirements for this degree are planned by the Director of the Institute in consultation with the Director of the School of Journalism and Communication, and are designed to accommodate the students' interests and needs.

Combined Honours programs are also possible in conjunction with other disciplines and are governed by the regulations of the departments concerned. Further details on these programs may be obtained from the Institute.

Admission Requirements

Admission to the program must be approved by the Institute of European and Russian Studies and by the Faculty of Public Affairs and Management Committee on Honours. Students with a 65 percent average or better in the OSSD or a C standing in the Carleton Qualifying-University year may be enrolled in the program in the First year. With the consent of the Institute, students may also enter the program in subsequent years provided they have maintained Honours standing and have completed the program's course requirements to that point.

Course Requirements

A total of 20.0 credits is required for the B.A.(Honours) in European and Russian Studies. Every student must complete 3.5 core credits; beyond the core requirements, students must offer standing in 7.0 concentration credits. In addition to the 10.5 credits required for the degree, all candidates must also fulfill the language requirement (details below).

Each year, candidates should consult with the Honours Adviser regarding course selection. It is recommended that students take either First-Year Seminar 01.102 (Social Impact of Transformation in the Post-Communist Era) or 01.112 (History of Western Civilization). Other first year courses should be from the 100-level or from higher-level courses open to first year students and should include History 24.101 History of Western Civilization (unless 01.112 is included in the student's program). Other courses taken at the first year level should be selected as preparation for more specialized courses in European and Russian Studies offered in various disciplines.

A. The 3.5 core credits required for the major are as follows:

History 24.101 or First-Year Seminar 01.112

Political Science 47.327 ★

Economics 43.370 ★

European and Russian Studies 55.200 and 55.400 ★

Concentration Credits

Students must fulfill the requirements listed below for one of the three concentration areas. The student must attain proficiency in a major European language appropriate to the area concentration, as noted. (See language requirement below).

Individualized programs can be worked out with the Honours Adviser. Of the four option credits in the area concentration, at least 2.0 credits must be at the 400-level, of which 1.0 credit must be a 400-level seminar or seminars, or an honours essay (55.498). Up to two of the four option credits may be from approved language courses approved by the Honours Adviser, normally at the 300-level or above (after fulfillment of basic language requirement). In

all cases, the area concentration may include approved literature and civilization courses - see the Institute for an approved list.

1. Russian-Area Concentration (Russian language)

Required concentration core credits (3.0 credits)

History (1.0 credit): 24.260 or 24.360

Political Science (1.5 credits): 47.328 ★ and 47.329 ★; and 47.314 or 47.326 ★

Geography (0.5 credit): 45.360 ★ or 45.460 ★

Option credits (4.0) selected from any of the following not used to meet Major core or Concentration core requirements:

European and Russian Studies: 55.402 ★, 55.405 ★, 55.407 ★, 55.408 ★, 55.409 ★, 55.410 ★, 55.411 ★, 55.498

Geography: 45.360 ★, 45.460 ★

History: 24.260, 24.360, 24.365 ★, 24.460, 24.461

Law: 51.486 ★

Philosophy: 32.221 ★, 32.222 ★

Political Science: 47.314, 47.431 ★, 47.432 ★, 47.433, 47.455 ★, 47.461 ★

Sociology and Anthropology: 53.205

2. Central and East European Concentration (German or Russian Language)

Required Concentration core credits (3.0 credits)

History (1.0 credit):

One of the following: 24.259, 24.260, 24.280, 24.360, 24.380

Political Science (1.5 credits):

47.314 and one of the following: 47.326 ★, 47.328 ★, 47.329 ★

Geography (0.5 credit):

One of the following: 45.360 ★ or 45.363 ★

Option credits (4.0) selected from any of the following not used to meet Major core or Concentration core requirements:

European and Russian Studies 55.402 ★, 55.405 ★, 55.407 ★, 55.408 ★, 55.410 ★, 55.411 ★, 55.498

Geography 45.360 ★, 45.363 ★, 45.460 ★

History 24.259, 24.260, 24.280, 24.281, 24.359 ★, 24.360, 24.365 ★, 24.366 ★, 24.380, 24.455, 24.456

Law 51.486 ★

Philosophy 32.221 ★, 32.222 ★, 32.306 ★

Political Science 47.326 ★, 47.328 ★, 47.329 ★, 47.333, 47.431 ★, 47.432 ★, 47.455 ★, 47.461 ★

Sociology and Anthropology 53.205

3. West European Concentration (Language German, Spanish, French, or Italian)

Required Concentration core credits (3.0 credits)

History (1.0 credit):

One of the following: 24.259, 24.280, 24.281, 24.380

Political Science (1.5 credits):

47.326 ★ and 1.0 credits from the following: 47.314, 47.328 ★, 47.329 ★

Geography (0.5 credit):

One of the following: 45.360 ★ or 45.363 ★

Option credits (4.0) selected from any of the following not used to meet Major core or Concentration core requirements:

Economics 43.427 ★

European and Russian Studies 55.498

Geography 45.363 ★

History 24.223, 24.224, 24.250, 24.259, 24.280, 24.281, 24.315 ★, 24.318, 24.320, 24.321 ★, 24.358, 24.363 ★, 24.364 ★, 24.380, 24.417, 24.455, 24.458, 24.480

Law 51.486 ★

Political Science 47.314, 47.333, 47.350 ★, 47.351 ★, 47.412 ★, 47.413 ★, 47.435, 47.455 ★, 47.493, 47.494

Philosophy 32.208 ★, 32.223 ★, 32.304 ★, 32.306 ★

Sociology and Anthropology 53.205

Language Requirement

All candidates are required to have knowledge of a major European language to be selected from the following: Russian, German, French, Spanish, Italian. This requirement may be fulfilled in one of two ways:

(a) completion of an advanced course in the language; for Russian, 36.302 fulfills this requirement; for French 20.245 or 20.260 fulfills this requirement; comparable course numbers for German, Spanish and Italian will be designated by the Institute.

(b) Certification by the unit offering the relevant language that the student has attained a level of language proficiency equivalent to completion of an advance course in the chosen language.

Academic Standing

Students must maintain Honours standing as prescribed by the general Faculty Requirements (see p. 72).

Graduate Program

The Institute offers an interdisciplinary Master of Arts program in Central/East European and Russian-Area Studies with the participation of faculty from the Departments of Art History, Economics, Geography, History, International Affairs, Law, Political Science, Russian, Sociology and the School of Business as well as invited specialists from other universities and visiting scholars from the former Soviet Union and East/Central Europe. It is designed for students wishing to acquire specialized knowledge of the area, and proficiency in Russian, before proceeding towards a doctoral degree in one of the disciplines represented in the program, either at Carleton or another university. The program is also suitable for students aspiring to a professional, business or government career which requires knowledge of the area. For details, consult the *Graduate Studies and Research Calendar*.

Requirement for Breadth, for students in B.A. or B.A.(Honours) degrees

Category for Breadth	Courses in this unit
The temporal dimension of human societies, analyzing times before the present era or societies other than our own	
The artifacts of the imagination in literature and/or other forms, or that addresses the life of the imagination and culture.	55.200
The understanding of social, technological and/or natural processes and the ways in which that understanding is obtained in science and social science.	All European and Russian Studies courses not listed in any other category
Matters of human values, ethics and social responsibilities	

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

First-Year Seminar in European and Russian Studies 01.102

Social Impact of Transformation in the Post Communist Era
Political, economic and social changes that have accompanied the collapse of the Berlin Wall. The role of society in these political upheavals and the impact of the end of the Cold War on reform in Western and developing countries. Limited enrolment. (Also listed as First-Year Seminar in Political Science 01.133.)

Precludes additional credit for Political Science 47.113★ and European and Russian Studies 55.113★.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

European and Russian Studies 55.113★

Social Impact of Transformation in the Post-Communist Era
Political, economic and social changes that have accompanied the collapse of the Berlin Wall. The role of the society in these political upheavals and the impact of the end of the Cold War on reform in Western and developing countries. (Also listed as Political Science 47.113★)

Precludes additional credit for First-Year Seminar 01.102 and First-Year Seminar in Political Science 01.133.

Lecture and discussion three hours a week.

European and Russian Studies 55.200

Literature and Culture in Europe

A survey of the literature and cultural texts that have defined Europe. Examination of fiction and non-fiction texts that have contributed to and reflected the development of European culture and society. Lecture and discussion three hours a week.

European and Russian Studies 55.400★

Social and Political Perspectives in Europe

The emergence of a European polity, identity and culture. Examination of whether "Europe" as a defined entity exists and the ways in which we may try to understand its evolution.

Prerequisite: European and Russian Studies 55.200 or Political Science 47.327★, or another 300-level course in European politics or history, or permission of the Institute.

Seminar three hours a week.

European and Russian Studies 55.402★

State-Society Relations in Transition

The relationship between social forces and state structures at both the national and local levels in the USSR and the post-communist states. Also offered at the graduate level, with additional or different requirements, as European and Russian Studies 55.502, for which additional credit is precluded.

Precludes additional credit for European and Russian Studies 55.491★ (if taken in 1998-99).

Prerequisite: Political Science 47.328★ or 47.329★ or 47.314 or History 24.360, or permission of the Institute.

Seminar three hours a week.

European and Russian Studies 55.405★

Environmental Problems and Politics in East/Central Europe and Eurasia

Nature, origins and policy responses viewed from economic, political, and geographic perspectives. Also offered at the graduate level, with additional or different requirements, as European and Russian Studies 55.505, for which additional credit is precluded.

Prerequisite: A previous course on the region or on environmental issues; or permission of the Institute.

Seminar three hours a week.

European and Russian Studies 55.406★

The Business Environment in East/Central Europe and the Soviet Successor States

Economic and legal environment in which new businesses are emerging in the region and the practical problems which face them. Regulatory structures, patterns or foreign trade, market characteristics,

scientific and technological base and business culture. (Also listed as Business 42.464 ★.)

Prerequisite: Economics 43.370 ★ or Business 42.361 ★; or permission of the Institute.

Seminar three hours a week.

European and Russian Studies 55.407 ★

Social and Political Discourse in Russia

Contemporary social and political issues covered in Russian-language media. Most course readings and instruction in Russian, but student participation may be in English and Russian. Also offered at the graduate level, with additional or different requirements, as European and Russian Studies 55.507, for which additional credit is precluded.

Prerequisites: Appropriate facility in the Russian language and permission of the Institute.

Seminar three hours a week.

European and Russian Studies 55.408 ★

Nationalism and Ethnic Conflict in Eastern and Central Europe

Ethnic basis of nationalism in the region. Ethnic politics and trends. Also offered at the graduate level with additional or different requirements, as European and Russian Studies 55.508, for which additional credit is precluded.

Precludes additional credit for European and Russian Studies 55.401 ★ or 55.404 ★ (if taken before 1995-96).

Prerequisite: Permission of the Institute.

Seminar three hours a week.

European and Russian Studies 55.409 ★

The Canadian and Russian North

Overview of social and political development of the Russian North, placing it in the context of experiences of other countries, with a particular focus on Canada. Includes examination of issues of aboriginal rights and governance. Also offered at the graduate level, with additional or different requirements, as European and Russian Studies 55.509, for which additional credit is precluded.

Precludes additional credit for European and Russian Studies 55.402 ★ (if taken before 1995-96).

Prerequisite: Political Science 47.328 ★, 47.329 ★, History 24.260, 24.360, 24.353 ★, Fourth-year standing in European and Russian Studies, or permission of the Institute.

Seminar three hours a week.

European and Russian Studies 55.410 ★

Nation-Building in Central and Eastern Europe

Processes of nation-building in the region examined in terms of a particular country, or set of countries. Also offered at the graduate level, with additional or different requirements, as European and Russian Studies 55.510, for which additional credit is precluded.

Prerequisite: Political Science 47.314, or 47.328 ★, or 47.329 ★ or History 24.360; or permission of the Institute.

Seminar three hours a week.

European and Russian Studies 55.411 ★

The Balkans

Differing paths of transition from communist rule. Sources of friction and conflict in the region. Emphasis on the Yugoslav crisis and its extra-regional dimensions.

Prerequisites: Political Science 47.314, or 47.328 ★ or 47.329 ★, or History 24.359 ★, or 24.360; or permission of the Institute.

Seminar three hours a week.

European and Russian Studies 55.490

Tutorial in European and Russian Studies

Tutorials or reading courses on selected topics may be arranged with the permission of the Institute and agreement of the instructor.

Prerequisite: Permission of the Institute.

European and Russian Studies 55.491 ★

Tutorial in European and Russian Studies

Tutorials or reading courses on selected topics may be arranged with the permission of the Institute and agreement of the instructor.

Prerequisite: Permission of the Institute.

European and Russian Studies 55.492 ★

Tutorial in European and Russian Studies

Tutorials or reading courses on selected topics may be arranged with the permission of the Institute and agreement of the instructor.

Prerequisite: Permission of the Institute.

European and Russian Studies 55.498

Honours Essay

Topic and faculty supervisor to be selected in consultation with Honours Adviser. Oral defense of essay is required.

Prerequisites: Fourth-year standing, a GPA of 9.0 or better in courses qualifying for credit in European and Russian Studies; and permission of the Institute.

School for Studies in Art and Culture

Film Studies

(Arts and Social Sciences)

423 St. Patrick's Building
Telephone: 520-5606

Academic Administration

Director, Bryan Gillingham

Assistant Director, André Loiselle

Supervisor of Graduate Studies, George McKnight

Supervisor of Undergraduate Studies, André Loiselle

Supervisor of Practica, Laura U. Marks

Teaching Staff

Professors

Christopher G. Faulkner, B.A. (Sir George Williams), M.A. (Western Ontario) • **Zuzana M. Pick**, B.A. (Montréal), L. ès L., M.A. (Paris), D. 3e. cycle (Paris)

Associate Professors

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Assistant Professors

André Loiselle, B.A., M.A., Ph.D. (British Columbia) • **Laura U. Marks**, B.A. (Swarthmore), M.A., Ph.D. (Rochester) • **Charles O'Brien**, B.A. (Nebraska), Ph.D. (Iowa)

Adjunct Research Professors

Blaine Allen, Queen's University • **Peter Baxter**, Queen's University • **Peter Harcourt**

Sessional Lecturer

Patricia Goodspeed

General Information

Film Studies is an academic discipline concerned with the history, criticism, theory and practice of the cinema both as an art form and as a documentary record of our time. The cinema is a source of pleasure and knowledge, and its study should form a part of one's cultural education. The program will enable the student to develop a critical faculty appropriate to intelligent understanding of the cinema by approaching its study as a scholarly activity that rewards systematic research, analysis and exposition.

In designing the curriculum, the Discipline has sought both integration and progressive development. A careful curricular development will ensure intellectual growth through either a B.A. (Honours) or B.A. program devoted to the study of film. While the courses have been articulated together, they remain distinct enough to permit a number of related intellectual approaches to the study of film, and to enable those approaches to be related to work in other disciplines.

Graduation Regulations

In order to graduate, students must fulfill all University graduation regulations (see p. 48), all Faculty regulations including those relating to First-Year Seminars and Breadth requirements (see p. 63), in addition to all discipline regulations and requirements as set out below.

Honours Program

All students who meet the general University Honours requirements, and who have a GPA of 6.0 or better in Film Studies, will be admitted to, and permitted to continue in, the Honours program. Other applicants will be given individual consideration on application to the Discipline. Honours students must have their

program approved by a discipline adviser.

Honours in Film Studies consists of a minimum of 9.0 credits in Film Studies as follows:

1. Film Studies 19.100;
2. Film Studies 19.200;
3. Film Studies 19.301 ★ and 19.351 ★, and 1.0 additional credit in Film Studies at the 300-level;
4. 2.0 credits in Film Studies at the 400-level;
5. 3.0 additional credits in Film Studies beyond the 100-level.

Combined Honours Programs

Combined Honours programs may be arranged through the Assistant Director. Both departments or disciplines must approve a Combined Honours program. A Combined Honours program in Film Studies and another subject includes at least 7.0 credits in Film Studies, as follows:

1. 19.100;
2. 19.200;
3. 19.301 ★ and 19.351 ★;
4. 1.0 credit in Film Studies at the 400-level;
5. 3.0 additional credits in Film Studies beyond the First year, 1.0 of which must be at the 300-level or above.

B.A. Program

All students who elect a B.A. program in Film Studies must have their program approved by a member of the Discipline of Film Studies. The B.A. program in Film Studies consists of a minimum

of 6.0 credits in Film Studies, as follows:

1. 19.100;
2. 19.200;
3. 2.0 credits at the 300-level;
4. 2.0 additional credits in Film Studies beyond the 100-level.

Minor in Film Studies

A Minor in Film Studies consists of 4.0 credits as follows:

1. 1.0 credit from the following: 19.100, or 19.229, or 19.268;
2. 2.0 credits at the 200-level from the following courses: 19.200, 19.211 ★, 19.216 ★, 19.221 ★, 19.229, 19.241 ★, 19.261 ★, 19.268;
3. 1.0 credit in Film Studies at the 300-level from the following courses: 19.301 ★, 19.315 ★, 19.325, 19.331 ★, 19.333, 19.351 ★, 19.371 ★, 19.329 ★

Where 19.229 or 19.268 is used to meet requirement #1, it cannot also be used to meet requirement #2.

Graduate Study

A Master of Arts program in Film Studies is offered through the Film Studies program of the School for Studies in Art and Culture. For further details see the current Calendar of the Faculty of Graduate Studies and Research.

Requirement for Breadth, for students in B.A. or B.A.(Honours) degrees

Category for Breadth	Courses in this unit
The temporal dimension of human societies, analyzing times before the present era or societies other than our own	
The artifacts of the imagination in literature and/or other forms, or that addresses the life of the imagination and culture.	All courses in Film Studies
The understanding of social, technological and/or natural processes and the ways in which that understanding is obtained in science and social science.	
Matters of human values, ethics and social responsibilities	

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Film Studies 19.100

Introduction to Film Studies

Introduction to the study of film that considers the nature of the medium, audience perception, historical and technical development of the cinema, and problems of theory and critical method. Focus on style and techniques; a period of film history; the film maker; and film genres.

Lecture and screening three hours a week, discussion one hour a week.

Film Studies 19.200

Film Theory, Historiography and Criticism

This course examines basic questions of film theory, historiography and criticism. Emphasis is given to developing critical skills through a close analysis of films, theoretical and historiographical writings. Prerequisites: Film Studies 19.100 and Second-year standing; or permission of the Discipline.

Lecture and screening three hours a week, lecture one hour a week.

Film Studies 19.211 ★

The Film Industry

The organization of the production, distribution and exhibition practices of various film industries. May include an examination of the relationship between a national film industry and its television industry.

Prerequisite: Film Studies 19.100 or permission of the Discipline. Lecture and screening three hours a week, lecture one hour a week.

Film Studies 19.216 ★

The Documentary

An examination of the work of individual film makers, of documentary styles and of organizations and institutions in the context of the history of documentary film making, including documentaries made for television. Non-fiction films other than documentaries may be considered. (Also listed as Journalism 28.216 ★.) Precludes additional credit for Film Studies 19.215 (Journalism 28.215).

Prerequisite: Film Studies 19.100 or permission of the Discipline. Lecture and screening three hours a week, lecture one hour a week.

Film Studies 19.221 ★

National Cinema

This course examines the film production of specific countries in order to determine the themes, the styles, and the character of a national cinema.

Prerequisite: Film Studies 19.100.

Lecture and screening three hours a week, lecture one hour a week.

Film Studies 19.229

The Canadian Cinema

A critical examination of Canadian cinema. The course relates the Canadian cinema to other aspects of Canadian culture, including television, and examines the conditions that have affected filmmaking in this country.

Precludes additional credit for Film Studies 19.328.

Prerequisite: Second-year standing, or permission of the Discipline. Lecture and screening three hours a week, lecture one hour a week.

Film Studies 19.241 ★

The Film Maker

A detailed study of the themes, the characteristic style, development and influence of one or more directors.

Prerequisite: Film Studies 19.100.

Lecture and screening three hours a week, lecture one hour a week.

Film Studies 19.261 ★

Film Genres

This course examines questions of generic form, drawing examples from world cinema.

Prerequisite: Film Studies 19.100.

Lecture and screening three hours a week, lecture one hour a week.

Film Studies 19.268

Forms and Conventions of the Cinema

A history of cinema that will examine the forms, structures and stylistic conventions of world cinema. Attention is given to the development of a critical idiom suited to the description, analysis, and evaluation of film. (Also listed as English 18.268.)

Prerequisite: Film Studies 19.100 or a 100-level course in English. Lecture and screening three hours a week, lecture one hour a week.

Film Studies 19.301 ★

Aspects of Film History

A study of major histories of film. Special attention is paid to historiographical assumptions, the critical judgements and the cultural values that have affected past and present evaluations of the cinema.

Precludes additional credit for Film Studies 19.300.

Prerequisites: Film Studies 19.200 and Third-year standing, or permission of the Discipline.

Lecture and screening three hours a week, seminar two hours a week.

Film Studies 19.315 ★

Questions of Documentary Practice

This course examines the theoretical implications of documentary film and documentary television practice. (Also listed as Journalism 28.315 ★.)

Prerequisite: At least 1.0 credit in Film Studies at the 200-level and Third-year standing, or permission of the Discipline.

Lecture and screening three hours a week, lecture one hour a week.

Film Studies 19.325

Studies in American Cinema

Focus on features such as the major production companies, the star system, genres, film style, and the role of the individual film maker. The course may also examine the relationship between cinema and television.

Precludes additional credit for Film Studies 19.228.

Prerequisite: 1.0 credit in Film Studies at the 200-level, or permission of the Discipline.

Lecture and screening three hours a week, lecture one hour a week.

Film Studies 19.329 ★

Topics in Canadian Cinema

Studies in various aspects of Canadian cinema. Topics may vary from year to year.

Precludes additional credit for Film Studies 19.328.

Prerequisite: At least 1.0 credit in Film Studies at the 200-level and Third-year standing, or permission of the Discipline.

Lecture and screening three hours a week, lecture one hour a week.

Film Studies 19.331 ★

Topics in Cinema and Gender

A study of selected topics in gender and cinema with emphasis on critical and historical questions.

Prerequisite: At least 1.0 credit in Film Studies at the 200-level and Third-year standing, or permission of the Discipline.

Lecture and screening three hours a week, lecture one hour a week.

Film Studies 19.333

Film and Society

An examination of film in relation to social and intellectual developments of the twentieth century. The ways in which the cinema has both shaped and been shaped by some of these developments are considered. (Also listed as Journalism 28.333.)

Prerequisite: At least 1.0 credit in Film Studies and Third-year standing, or permission of the Discipline or the School.

Lecture and screening three hours a week, lecture one hour a week.

Film History 19.342 ★

Film Music

The use of music in film, from the silent era to the present day. Techniques, styles and theory of film music through the examination of selected films. (Also listed as Music 30.342 ★.)

Lectures three hours a week, screening two hours a week.

Film Studies 19.351 ★

Film Theory

A detailed study of major film theories and their relationship to critical practice.

Precludes additional credit for Film Studies 19.350 and 19.368.

Prerequisites: Film Studies 19.200 and Third-year standing, or permission of the Discipline.

Lecture and screening three hours a week, seminar two hours a week.

Film Studies 19.371 ★

Topics in Animation, Video, and Experimental Film

A study of selected topics in animation, video or experimental film.

Prerequisite: 1.0 credit in Film Studies at the 200-level or permission of the Discipline.

Lecture and screening three hours a week, lecture one hour a week.

Film Studies 19.381 ★

Audiovisual Practice

An examination of practical and conceptual approaches to film studies from the point of view of production using models of audiovisual practice.

Prerequisite: Film Studies 19.200.

Lecture/workshops four hours a week.

Film Studies 19.400

Modes of Historical Research

This course develops the critical and archival skills necessary for individual research in the field of film history, and includes practical research related to the course material.

Prerequisite: Film Studies 19.301 ★ or permission of the Discipline.

Lecture and screening three hours a week, seminar two hours a week.

Film Studies 19.402 ★

Topics in Audio-Visual Culture

This seminar will examine selected aspects of the audio-visual cultures of the late nineteenth and twentieth centuries. (Also listed as Art and Culture 08.402 ★.)

Prerequisite: Fourth-year standing in Film Studies, or permission of the Discipline.

Seminar three hours a week.

Film Studies 19.421 ★

Selected Topics in National Cinemas

A study of a selected topic in national cinema.

Prerequisite: Fourth-year Honours standing in Film Studies or permission of the Discipline.

Lecture and screening three hours a week, seminar two hours a week.

Film Studies 19.422 ★

Film Music Analysis

An examination through selected films/programs of approaches to understanding music as an integral dimension of film and television. Emphasis will be placed on theories of signification in both film/television and music, and how they can be understood to relate. (Also listed as Music 30.422 ★.)

Prerequisite: Film Studies 19.342 ★ or Music 30.342 ★, or permission of the Discipline.

Lecture and screening three hours a week, seminar one and one-half hours a week.

Film Studies 19.429 ★

Selected Topics in Canadian Cinema

A study of selected topics in Canadian cinema.

Prerequisite: Fourth-year Honours standing in Film Studies or permission of the Discipline.

Lecture and screening three hours a week, seminar two hours a week.

Film Studies 19.441 ★

Selected Topics in Film Authorship

A study of questions of authorship in the cinema, concentrating on one or more film makers.

Prerequisite: Fourth-year Honours standing in Film Studies or permission of the Discipline.

Lecture and screening three hours a week, seminar two hours a week.

Film Studies 19.451 ★

Selected Topics in Film Theory

A study of a selected topic in film theory.

Prerequisite: Film Studies 19.351 ★ or permission of the Discipline.

Lecture and screening three hours a week, seminar two hours a week.

Film Studies 19.480 ★

Seminar in Film/Video Archival or Curatorial Practice

Selected topics in film/video archival or curatorial practice, including questions related to cultural policy, exhibition, conservation, and interrelationship of media. Students are expected to bear all travel and other costs arising from required visits to local facilities.

Prerequisite: Fourth-year standing in Film Studies or permission of the Discipline.

Seminar three hours a week.

Film Studies 19.485 ★

Practicum in Film and Film Studies

Practical experience through working on specific projects under the supervision of staff at a museum, gallery, archive, or production company in the Ottawa area. A maximum of 0.5 credit may be offered in fulfillment of Film Studies requirements.

Prerequisite: Fourth-year standing in Film Studies or permission of the Discipline.

Film Studies 19.486 ★

Practicum in Film and Film Studies

Practical experience through working on specific projects under the supervision of staff at a museum, gallery, archive, or production company in the Ottawa area. A maximum of 0.5 credit may be offered in fulfillment of Film Studies requirements.

Prerequisite: Fourth-year standing in Film Studies or permission of the Discipline.

Film Studies 19.487 ★

Practicum in Film and Film Studies

Practical experience through working on specific projects under the supervision of staff at a museum, gallery, archive, or production company in the Ottawa area. A maximum of 0.5 credit may be offered in fulfillment of Film Studies requirements.

Prerequisite: Fourth-year standing in Film Studies or permission of the Discipline.

Film Studies 19.491 ★

Special Topic

This course offers selected topics in film studies not ordinarily available in the regular course program. The choice of topic or topics will vary at least every two years and will be announced well in advance of the registration period.

Prerequisite: Fourth-year standing in Film Studies or permission of the Discipline.

Screening three hours a week, seminar two hours a week.

Film Studies 19.495

Independent Study

For students who wish to study a specific topic. Proposed projects must be approved by the Program Committee. Written request outlining the project must be submitted by the first day of Fall term. An essay is the usual assignment.

Prerequisites: Fourth-year Honours standing in Film Studies and permission of the Discipline.

French

(Arts and Social Sciences)

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Academic Administration

Chair, Dominique Rosse

Supervisor of Graduate Studies, Charles Doutrelepon

Supervisor of B.A. Studies, Juliette Kealey

Assistant Chair, Juliette Kealey

Supervisor of B.A. (Honours) Studies, Charles Doutrelepon

Teaching Staff

Professors

Albert Halsall, B.A. (Liverpool), M.A. (McMaster), Ph.D. (St. Andrews) • **Patricia Smart**, B.A. (Toronto), M.A. (Laval), Ph.D. (Queen's), F.R.S.C. • **Donald W. Smith**, B.A. (York), M. ès L. (Paris), Ph.D. (Ottawa) • **Evelyne Voldeng**, B.A., M.A., D. de 3e cycle (Aix-en-Provence)

Associate Professors

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Assistant Professor

Dominique Rosse, L. ès L. (Rheims), M.A., Ph.D. (Ottawa)

Instructors

Vincent Basseville, B.A. (Carleton), M.A. (Ottawa) • **Corinne Cordier-Gauthier**, Licence (Paris-Nanterre), M.A. (Paris-Sorbonne), D.E.A. (Montpellier) • **Chantal Dion**, B.A. (Sherbrooke), M.A. (Ottawa) • **Lynda Dupuis**, B.A., B.Ed., M.A. (Ottawa) • **Nandini Sarma**, B.A. (Carleton), M.A. (Montréal) • **Christiane Thérien**, B.A., M.A. (Ottawa) • **Brigitte Vincent-Smith**, Licence, Maîtrise (Université de Savoie)

Adjunct Research Professors

A. Elbaz • **M. Gaulin** • **P. Laurette** • **E. Zimmerman**

Adjunct Professors

H.P. Clive • **O. Condemine** • **J. Miquet** • **J.S. Tassie** • **P. van Rutten**

Sessional Lecturer

M. Veilleux-Sukunda

General Information

Carleton University is situated in the bilingual community of Ottawa-Hull and students are encouraged to take advantage of the multiple opportunities for the use of the French language. Theater, film, radio, television, the press, conversations with people from all walks of life, French-language libraries and bookstores are at hand to supplement academic programs. Classes are conducted in French unless otherwise indicated. The Department has at its disposal a language laboratory, audio-visual, multimedia and Internet equipment for use in language, literature, linguistics and translation classes. Updated information on programs and activities is available on the Internet at: <http://www.carleton.ca> under the menu items Faculty of Arts and Social Sciences and French (<http://www.carleton.ca/french/Fre.homepage.html>).

English-speaking students who wish to graduate with a B.A. are normally required to pass an oral examination testing their proficiency in spoken French. The examination takes place at the beginning of the final year with the option of repeating it at the end of the same academic year.

Graduation Regulations

In order to graduate, students must fulfill all University graduation Regulations (see p. 48), all Faculty regulations, including those relating to First-Year Seminars and Breadth requirements (see p. 63), and all Major regulations and requirements as set out below.

Student Exchanges

The Department of French has two student exchanges, one with the Université du Québec in Trois-Rivières, and the other with the Université de Savoie in Chambéry, France. These exchanges make it possible for a maximum of four Honours students, normally English-speaking, two of whom go to Québec and two to France, to spend their Third year in an immersion milieu. Financial assistance is also available. For more information please consult the Department.

B.A. (Honours) Programs

Two patterns are available in the Honours program, one focusing on literary studies, the other on French linguistics. Course patterns are designed to ensure an appreciation of French and French-Canadian language, literature, and competence in the French language. Interested candidates will note the general regulations governing Honours.

B.A. (Honours) in French

Both patterns in Honours French share compulsory core courses:

1. 1.0 credit chosen from French 20.145 or 20.160 or 20.169 or First-Year Seminar 01.147 or 01.148;
2. 1.0 credit chosen from French 20.245 or 20.260 or 20.269;
3. French 20.270 and 20.280 and 20.286;
4. French 20.360;

AND

(for the French Literary Studies pattern:)

- 5.a). French 20.370★ and 20.371★ and 20.372★ and 20.373★;
 - 6.a). French 20.470★ and 20.471★ and 20.472★ and 20.473★;
- OR

(for the French Linguistics Studies pattern:)

- 5.b). 2.0 credits chosen from French 20.380★, 20.381★, 20.382★, 20.383★ and 20.386;
- 6.b). 2.0 credits chosen from French 20.480★, 20.481★, 20.482★, 20.483★ and 20.486.

Combined B.A. (Honours)

Combined Honours programs are available in French and other disciplines in arts or social sciences.

The Honours programs combining two languages prepare the student either for graduate work or for the Ontario College of Education courses leading to the Interim High School Assistant's Certificate Type A, and must be planned in close consultation with the departments concerned. The combined programs with History or Political Science are suited for various kinds of public careers.

Both patterns of the Combined B.A. (Honours) in French, normally consisting of 7.0 credits, share core course selections as below:

1. One of French 20.145 or 20.160 or 20.169 or First-Year Seminar 01.147 or 01.148;
2. One of French 20.245 or 20.260 or 20.269;
3. French 20.270;
4. French 20.280;

AND

(for the French Literary pattern:)

- 5.a) 3.0 credits including at least one at the 400-level chosen from 20.370★, 20.371★, 20.372★, 20.373★ and from 20.470★, 20.471★, 20.472★, 20.473★;

OR

(for the French Linguistics Studies pattern:)

- 5.b). 3.0 credits including at least one at the 400-level chosen from 20.380★, 20.381★, 20.382★, 20.383★ and from 20.480★, 20.481★, 20.482★, 20.483★.

For the Literary Studies patterns in either B.A. (Honours) or Combined B.A. (Honours), at least 1.0 credit in French literature (from France) must be obtained and at least 1.0 credit in French-Canadian literature

Combined Honours in French and Journalism for the B.J. Degree

The course requirements are as follows:

1. One of French 20.145 or 20.160 or 20.169 or First-Year Seminar 01.147 or 01.148;
2. One of French 20.245 or 20.260 or 20.269;

3. French 20.270;

4. French 20.360;

5. 2.0 further French credits at the 300-level;

6. 1.0 further French credit at the 400-level.

Students should also consult the School of Journalism and Communication.

B.A. Program in French

The following program will help students to consolidate their knowledge of French, and to gain a comprehensive view of various aspects of French, French-Canadian and Francophone literature as well as French linguistics.

This program consists of 6.0 credits in French.

1. One of French 20.145 or 20.160 or 20.169 or First-Year Seminar 01.147 or 01.148;
2. One of French 20.245 or 20.260 or 20.269;
3. French 20.270;
4. French 20.280;
5. French 20.360;
6. 1.0 credit chosen from either 20.370★ to 20.373★ or from 20.380★ to 20.383★.

Minor in French

A minor is made up of 4.0 credits in French and is an attractive option for students in disciplines other than French. The Minor consists of 2.0 compulsory credits (20.145 and 20.245 OR 20.160 and 20.260 OR 20.169 and 20.269 OR 20.160/169 or 20.245 or 20.260/269 in combination with First-Year Seminar 01.147 and/or 01.148) and 2.0 elective credits that allow students to acquire a grounding in a specific area such as:

Literature (20.270, 1.0 credit chosen from 20.370★ to 20.373★);

French linguistics (20.280, 1.0 credit chosen from 20.380★ to 20.383★);

Translation (20.286, 20.386);

French language (20.270 or 20.280; 20.360).

Other elective courses can be chosen with the approval of the Department.

Certificate in French Language Studies

A 6.0-credit undergraduate certificate designed for both part-time and full-time students wishing to perfect their spoken and written French. Students may also earn the Certificate as part of a B.A. (Honours) in French, or as part of a Combined B.A. (Honours) in French and another discipline.

Course Requirements

6.0 credits in French consisting of:

1. two credits from French (20.145 and 20.245 OR 20.160 and 20.260 OR 20.169 and 20.269 OR 20.160/169 or 20.245 or 20.260/269 in combination with First-Year Seminar 01.147 and/or 01.148);
2. French 20.280 and 20.286 and 20.360;
3. 1.0 credit from French 20.380★ to 20.383★ or French 20.480★ to 20.483★;

For candidates with knowledge of French to the level of French 20.160 or 20.169:

1. First-Year Seminar 01.147 or 01.148 and French 20.260 or 20.269 OR 20.280 and 20.286 or 20.360;

French

2. French 20.386 or 20.486;

3. 1.0 credit from French 20.380 ★ to 20.383 ★ or French 20.480 ★ to 20.483 ★.

Students are not permitted to count the same course(s) towards both certificates offered by the Department of French. Should any student undertake a second certificate, appropriate course substitutions will be required.

Admission Requirements

(See p. 32)

Certificate in French Translation Studies

A 6.0-credit undergraduate certificate designed for both part-time and full-time students wishing to improve their skills in translation. While it is not a professional program, this certificate should meet the needs of those who are occasionally called upon to translate in their work environment. Students may also earn the Certificate as part of a B.A.(Honours) in French, or as part of a Combined B.A. (Honours) in French and another discipline.

Course Requirements

6.0 credits consisting of:

1. One of French 20.145 or 20.160/ 169 or First-Year Seminar 01.147 or 01.148, with the approval of the Department, a course given in French in another subject;

2. French 20.286;

3. French 20.360;

4. French 20.386;

5. French 20.486;

6. French 20.487;

Students are not permitted to count the same course(s) towards both certificates offered by the Department of French. Should any student undertake a second certificate, appropriate course substitutions will be required.

Admission Requirements

(See p. 32)

Graduate Program

The Department offers studies leading to the M.A. degree. The Department offers a substantial number of courses in a wide variety of subjects. For further information please consult the Graduate Studies and Research Calendar.

Graduate Courses Open to Undergraduates

(With permission of the Department)

French

20.502 ★ Linguistique du français I

20.503 ★ Linguistique du français II

20.506 ★ Linguistique du français langue seconde

20.507 ★ Traduction: théorie et pratique

20.542 ★ Littérature et rhétorique

20.544 ★ Auteurs I

20.546 ★ Genres I

20.550 ★ Littérature canadienne-française I

20.570 ★ Aspects littéraire culturel particulier

Requirement for Breadth, for students in B.A. or B.A.(Honours) degrees

Category for Breadth	Courses in this unit
The temporal dimension of human societies, analyzing times before the present era or societies other than our own	(20.) 271
The artifacts of the imagination in literature and/or other forms, or that addresses the life of the imagination and culture.	All French courses not listed in any other category
The understanding of social, technological and/or natural processes and the ways in which that understanding is obtained in science and social science.	(20.) 280, 380 ★, 381 ★, 382 ★, 383 ★
Matters of human values, ethics and social responsibilities	

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

French Placement for Language Students

Students who have not previously taken a language course in the Department and who wish to enroll in French 20.107, 20.145, 20.160 or 20.169, 20.245, 20.260 or 20.269 must read and follow the guidelines for choosing French language courses that can be found in the Registration Instructions and Class Schedule booklet and follow the instructions of the Touch Tone Registration System. Before selecting a language course, students should note that there are three levels in the language courses and the following sequence applies:

Level 1: 20.107

Level 2: 20.145 or 20.160 or 20.169

Level 3: 20.245 or 20.260 or 20.269

Students cannot go backward in the sequence of levels. Students should also note that 20.106 can be taken simultaneously with 20.107.

Note: Students desiring a First-year French credit to satisfy the language requirement of their department or school should consult that department or school.

First-Year Seminar in French 01.147

What About Literature?

Study of French language literature in the larger context of culture and the other arts. This course is given in French. Limited enrolment.

Precludes additional credit for First-Year Seminar 01.148, French 20.140, 20.141, 20.145, 20.150, 20.151, 20.152, 20.161, 20.162 and 20.163.

Prerequisite: OAC in French or permission of the Department. Seminar three hours a week.

First-Year Seminar in French 01.148

Thinking About Talking?

Study of the French language and linguistics. This course is given in French. Limited enrolment.

Precludes additional credit for First-Year Seminar 01.147, French 20.140, 20.141, 20.145, 20.150, 20.151, 20.152, 20.160 and 20.169.
Prerequisite: OAC in French or permission of the Department.
Seminar: Three hours a week.

French 20.106

Reading French

Enable students from other departments to read academic texts in French from various fields with reasonable ease. Basic French grammar and vocabulary. Individual reading in the student's specialization. Given in English. Open to beginners.

Prerequisite: Registration by permission of the Department.

Lecture plus discussion three hours a week.

French 20.107

French I

This course emphasizes both oral expression and comprehension leading to the development of reading and writing skills. Compulsory attendance. Limited enrolment. No auditors.

Precludes additional credit for French 20.120 and 20.130.

Prerequisite: French Placement.

Lecture three hours a week.

French 20.145

French II a)

Enrichment of written and oral skills. Texts from various cultural areas to reinforce language skills. Compulsory attendance. Limited enrolment. No auditors.

Precludes additional credit for First-Year Seminar 01.147, 01.148, French 20.140, 20.141, 20.150, 20.151 and 20.160, 20.169 and 20.209.

Prerequisite: French 20.107 or French Placement.

Lecture three hours a week.

French 20.160

French II b)

Enrichment of written and oral skills. Texts from the areas of literature and culture to reinforce language skills. Compulsory attendance. Limited enrolment. No auditors.

Precludes additional credit for French 01.147, 01.148, 20.140, 20.141, 20.145, 20.150, 20.151 and 20.209.

Prerequisite: OAC in French or French Placement.

Lecture three hours a week.

French 20.169

French II for Francophones

Approfondissement de la langue écrite et orale. Étude de textes littéraires et culturels. Présence obligatoire. Maximum 40 étudiants. Pas d'auditeurs.

Precludes additional credit for French 20.140, 20.141, 20.147, 20.150, 20.151 and 20.160.

Prerequisite: OAC in French or French Placement.

Lecture three hours a week.

French 20.245

Techniques d'expression écrite et orale II a)

Composition française. Perfectionnement du français oral. Enrichissement du vocabulaire, perfectionnement grammatical, lecture de textes littéraires, culturels et spécialisés.

Precludes additional credit for French 20.211 and 20.212.

Prerequisite: French 20.145 or permission of the Department.

Lecture three hours a week.

French 20.260

Techniques d'expression écrite et orale II b)

Composition française. Perfectionnement du français oral. Enrichissement du vocabulaire, perfectionnement grammatical, lecture de textes littéraires, culturels et spécialisés.

Precludes additional credit for French 20.211 and 20.212 and 20.269.

Prerequisite: French 01.147, 01.148, 20.160 or 20.169 or permission of the Department.

Lecture three hours a week.

French 20.269

Techniques d'expression écrite et orale II pour francophones et étudiants bilingues

Composition française. Perfectionnement du français oral. Enrichissement du vocabulaire, perfectionnement grammatical, lecture de textes littéraires, culturels et spécialisés.

Precludes additional credit for French 20.211 and 20.212 and 20.260.

Prerequisite: French 20.160 or 20.169 or permission of the Department.

Lecture three hours a week.

French 20.270

Introduction à la littérature française

Initiation aux valeurs, aux procédés et aux genres littéraires. Introduction aux diverses approches critiques. Textes choisis parmi les grands textes des littératures française, québécoise et canadienne-française.

Precludes additional credit for French 20.161, 20.162 and 20.163.

Prerequisite: French 01.147, 01.148, 20.145, 20.160, 20.169 or permission of the Department.

Lecture three hours a week.

French 20.271

Civilization and Culture

The culture, institutions and the intellectual and political life of the Francophonie. Given in English, this course is designed for students interested in the vitality and the diversity of French cultures. Does not count as part of the specific requirements for a B.A. (Honours) or B.A. degree in French. No Auditors.

Prerequisite: Permission of the Department.

Lecture three hours a week.

French 20.280

Introduction à la linguistique du français

Initiation aux principes et méthodes d'analyse linguistique. Application de ces éléments à la description et à l'analyse du français.

Precludes additional credit for French 20.232★ and 20.233★.

Prerequisite: French 01.147, 01.148, 20.145, 20.160 or 20.169; or permission of the Department.

Lecture three hours a week.

French 20.286

Initiation à la traduction

Comparaisons d'ordre grammatical, lexical et stylistique entre l'anglais et le français. Exercices de traduction de l'anglais au français visant l'expression et exercices de traduction du français à l'anglais visant la compréhension.

Precludes additional credit for French 20.231.

Prerequisite: French 01.147, 01.148, 20.145, 20.160 or 20.169; or permission of the Department.

Lecture three hours a week.

French 20.360

Français écrit et oral

Cours de langue avancé. Commun aux anglophones et aux francophones.

Prerequisite: French 20.245, 20.260 or 20.269; or permission of the Department.

Lecture three hours a week.

French 20.370★

Littérature française I

Principaux courants de la littérature française du Moyen Âge au XVIIe siècle. Étude détaillée de plusieurs aspects de cette littérature dans un choix de textes représentatifs.

Precludes additional credit for French 20.261★, 20.262★ and 20.263★.

Prerequisite: French 20.270 or permission of the Department.

Lecture three hours a week.

French 20.371 ★

Littérature française II

Principaux courants de la littérature française du XVIIIe au XXe siècle. Étude détaillée de plusieurs aspects de cette littérature dans un choix de textes représentatifs.

Precludes additional credit for French 20.264 ★, 20.265 ★ and 20.266 ★.

Prerequisite: French 20.270 or permission of the Department.
Lecture three hours a week.

French 20.372 ★

Littérature québécoise, acadienne et canadienne-française I

Principaux courants de la littérature québécoise, acadienne et canadienne-française de la Nouvelle-France à aujourd'hui. Étude détaillée de plusieurs aspects de cette littérature dans un choix de textes représentatifs.

Precludes additional credit for French 20.267 ★ and 20.268 ★.
Prerequisite: French 20.270 or permission of the Department.
Lecture three hours a week.

French 20.373 ★

Littératures francophones

Principaux courants des littératures francophones (africaine, belge, caraïbéenne, suisse). Étude détaillée de plusieurs aspects de cette littérature dans un choix de textes représentatifs.

Prerequisite: French 20.270 or permission of the Department.
Lecture three hours a week.

French 20.374 ★

Littérature québécoise, acadienne et canadienne-française II

Principaux courants de la littérature québécoise, acadienne et canadienne-française à l'époque contemporaine. Étude thématique détaillée de plusieurs aspects de cette littérature dans un choix de textes représentatifs.

Precludes additional credit for French 20.267 ★ and 20.268 ★.
Prerequisite: French 20.270 or permission of the Department.
Lecture three hours a week.

French 20.380 ★

Histoire de la langue française

Étude de l'évolution de la prononciation, de la grammaire et du vocabulaire français, des origines à nos jours.

Precludes additional credit for French 20.332 ★.
Prerequisite: French 20.280 or permission of the Department.
Lecture three hours a week.

French 20.381 ★

Morphologie et syntaxe du français

Étude linguistique des structures du mot et de la phrase. Approches descriptives et théoriques.

Prerequisite: French 20.280 or permission of the Department.
Lecture three hours a week.

French 20.382 ★

Sémantique et lexicologie du français

Étude linguistique du sens et de la structure du vocabulaire français. Sémantique de la phrase et du discours.

Precludes additional credit for French 20.433 ★.
Prerequisite: French 20.280 or permission of the Department.
Lecture three hours a week.

French 20.383 ★

Français canadien

Étude des particularités du français parlé et écrit au Canada. Approches descriptives et sociolinguistiques.

Precludes additional credit for French 20.332.
Prerequisite: French 20.280 or permission of the Department.
Lecture three hours a week.

French 20.386

Principes et méthodes de la traduction

Initiation aux principes sous-jacents à la traduction en particulier de

l'anglais au français. Exercices pratiques s'appliquant à des textes généraux ou spécialisés (scientifiques, administratifs, commerciaux, etc.)

Precludes additional credit for French 20.331.

Prerequisite: French 20.286 or permission of the Department.
Lecture three hours a week.

French 20.470 ★

Aspects de la littérature française I

Le contenu précis de ce cours varie selon les années. Sujet pour 1999-2000: L'émergence du roman en prose au XIIIe siècle. Roman en vers et en prose. Fragments et cycles. Syntaxes (interpolations, entrelacements). Thématique: le Graal et les couples) Perceval-roi pêcheur, Lancelot-Galaad, Merlin-Arthur).

Prerequisite: French 20.270 or permission of the Department.
Seminar two hours a week.

French 20.471 ★

Aspects de la littérature française II

Le contenu précis de ce cours varie selon les années. Sujet pour 1999-2000: Le roman au XVIIe siècle. L'évolution de la forme romanesque au XVIIe siècle; du roman héroïque au roman comique et parodique: Madeleine de Scudéry et H. d'Urfé, Sorel, Scarron, Furetière.

Prerequisite: French 20.270 or permission of the Department.
Seminar two hours a week.

French 20.472 ★

Aspects de la littérature québécoise ou canadienne-française

Le contenu précis de ce cours varie selon les années. Sujet pour 1999-2000: La symbolique des lieux et la notion de "pays" dans six romans québécois: *Maria Chapdelaine*, *Ménard*, *maître-draveur*, *Le Survenant*, *Poussière sur la ville*, *Prochain Épisode* et *L'Isle au Dragon*.

Prerequisite: French 20.270 or permission of the Department.
Seminar two hours a week.

French 20.473 ★

Littératures et cultures de la francophonie

Le contenu précis de ce cours varie selon les années. Sujet pour 1999-2000: Théâtre post-colonial: France, Québec, Martinique, Guadeloupe. Relations problématiques vécues par des dramaturges des aires francophones. Questionnements identitaires où des catégories de race et de genre se définissent dans des relations de pouvoir. Pièces de Genêt, Tremblay, Condé et Césaire.

Precludes additional credit for French 20.471 ★.
Prerequisite: French 20.270 or permission of the Department.
Seminar two hours a week.

French 20.480 ★

Aspects de la linguistique du français I

Le contenu précis de ce cours varie selon les années. Sujet pour 1999-2000: Syntaxe avancée du français. Les diverses composantes du système linguistique et de leurs interactions. Approche lexicaliste et théorie X-barre appliquée au français. Syntaxe minimaliste. Principes et contraintes. Étude variationnelle de la morphologie et de la syntaxe. Règles de mouvements et de variations. Références et anaphores. Also offered at the graduate level, with additional or different requirements, as French 20.503, for which additional credit is precluded.

Prerequisite: French 20.280 or permission of the Department.
Seminar two hours a week.

French 20.481 ★

Aspects de la linguistique du français II

Le contenu précis de ce cours varie selon les années. Sujet pour 1999-2000: Les français d'Amérique: genèse et comparaison. Étude comparée et recherches portant sur différents aspects des variétés de français parlées en Amérique: langues en contact, histoire, évolution, aménagement, standardisation, droits linguistiques, survie du fait français, îlots francophones, etc.; français régionaux, dialectaux, populaires, français créoles. Différentes approches.

Prerequisite: French 20.280 or permission of the Department.
Seminar two hours a week.

French 20.482 ★

Aspects de la linguistique du français III

Le contenu précis de ce cours varie selon les années. Sujet pour 1999-2000: Syntaxe et communication. Liens: analyse grammaticale et stratégies de communication à travers l'étude de la syntaxe des prépositions, de la syntaxe des déterminants, et de la syntaxe des auxiliaires.

Prerequisite: French 20.280 or permission of the Department.
Seminar two hours a week.

French 20.483 ★

Aspects de la linguistique du français IV

Le contenu précis de ce cours varie selon les années. Sujet pour 1999-2000: Linguistique appliquée. Éléments centraux pour l'apprentissage et pour l'enseignement de la langue. Liens avec la linguistique, avec la phonétique, avec les études cognitives. Analyse succincte des différentes approches théoriques. Rapport de la théorie et de la pratique dans l'enseignement. Applications à l'enseignement du français.

Prerequisite: French 20.280 or permission of the Department.
Seminar two hours a week.

French 20.486

Traduction littéraire

Traduction de l'anglais au français et du français à l'anglais de textes littéraires. Analyses de traductions déjà parues. Retraduction.

Precludes additional credit for French 20.431.

Prerequisite: French 20.286 or permission of the Department.
Seminar two hours a week.

French 20.487

Tutorial

Special Topics in Linguistics, Literature or Translation under the supervision of a faculty member.

Prerequisite: Permission of the Department.
Hours to be determined.

French 20.488 ★

Tutorial

Special Topics in Linguistics, Literature or Translation under the supervision of a faculty member.

Prerequisite: Permission of the Department.
Hours to be determined.

Geography

(Arts and Social Sciences/Science)

B349 Loeb Building
Telephone: 520-2561
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Academic Administration

Chair, J. Kenneth Torrance

Supervisor of B.A. Studies, To be announced

Supervisor of Graduate Studies, To be announced

Supervisor of B.Sc. Studies, To be announced

Teaching Staff

Professors

John Clarke, B.A. (Queen's of Belfast), M.A. (Manitoba), Ph.D. (Western Ontario) • **Fiona D. Mackenzie**, B.A. (London), M.A. (Carleton), Ph.D. (Ottawa) • **Michael W. Smith**, B.Sc. (Liverpool), M.A. (Georgia), Ph.D. (British Columbia) • **D.R. Fraser Taylor**, M.A. (Edinburgh), P.G.C.E. (London), Ph.D. (Edinburgh) • **J. Kenneth Torrance**, B.S.A. (Guelph), M.S., Ph.D. (Cornell) • **Iain Wallace**, B.A., Ph.D. (Oxford)

Associate Professors

David Bennett, B.A., Ph.D. (Liverpool) • **Michael Brklacich**, B.Sc. (Trent), M.A. (Guelph), Ph.D. (Waterloo) • **Chris Burn**, B.Sc. (Durham), M.A., Ph.D. (Carleton) • **S. Dalby**, B.A. (Trinity College), M.A. (Victoria), Ph.D. (Simon Fraser) • **Michael Fox**, B.A. (Sheffield), M.A. (Carleton) • **Douglas J. King**, B.A.Sc., M.Sc.F., Ph.D. (Toronto) • **Fran Klodowsky**, B.A. (Toronto) M.A. (Ohio State), Ph.D. (Queens) • **Shelagh J. Squire**, B.A. (Winnipeg), M.A. (Carleton), Ph.D. (London) • **John E. Tunbridge**, B.A., M.A. (Cambridge), Ph.D. (Bristol) •

Assistant Professors

Joyce Lundberg, B.Sc. (Trinity College), M.Sc. (Australian National), Ph.D. (McMaster) • **Gennady Ozornoy**, M.A. (Leningrad State University, Alberta), Ph.D. (Leningrad Institute of Finance and Economics, Toronto)

Lecturer

Nancy Doubleday, B.Sc. (Brock), B.Ed. (Toronto), LL.B., M.E.S. (York) of the Bar of Ontario

Instructors

Christine E. Earl, B.Sc. (Western) • **Danny Patterson**, B.A., M.A. (Carleton) • **Steve Prashker**, B.Sc., M.Sc. (McGill)

Geoprocessing Analyst

Steve Prashker

Cartographer

Christine E. Earl

Honorary Research Professor

Jack D. Ives

Distinguished Research Professor

Peter J. Williams

Adjunct Research Professors

F. Ahern • **R. Bollman** • **V. Jefremovas** • **V. Konrad** • **E.W. Manning** • **J. Marshall** • **V.R. Parameswaran** • **A. Rencz** • **E.M. Siekierska** • **A. Spector** • **I.C. Taylor** • **T.L. White**

Adjunct Professors

P. Johnson, **T. Wilkinson**

General Information

The Department of Geography and Environmental Studies has programs of study leading to the following degrees in Geography: B.A. (Honours), B.Sc. (Honours), B.A., M.A., and Ph.D. There is also a B.A. (Honours) program in Geographic Information Processing (GIP) and a concentration in Geographic Information Processing (GIP) under the B.Sc. (Honours) program. The undergraduate programs in Geography provide a foundation for understanding the world from human and biophysical perspectives with a particular focus on Geography's unique role for evaluating change at local, regional, national and global scales. There is opportunity to develop expertise in one of the following geographic themes: Culture, Society and Space; The Physical Environment; Societal and Environmental Change; and Geographic Information Processing.

It is also possible to complete combined B.A. (Honours) programs between Geography and many disciplines in Arts and Social Sciences and Public Affairs and Management, including Law, Economics, History, Anthropology, Psychology, Political Science, Canadian Studies, Sociology, Journalism and Biology. There is also a Combined Honours Geography and Biology program. Even without the formality of a Combined program it is possible for those pursuing a single B.A. or Honours program in Geography to develop a subsidiary thematic or regional concentration by taking a variety of non-geography electives. Please contact the Department of Geography and Environmental Studies for information about these possibilities.

Graduation Regulations

In order to graduate, B.Sc. students must fulfill all University graduation regulations (see p. 48), and all Faculty regulations (see p. 109). B.A. students must fulfill all University graduation regulations (see p. 48) and all Faculty regulations including those for First-Year Seminars and Breadth requirements (see p. 63). In addition, all departmental regulations as set out below must also be fulfilled.

B.A. Programs in Geography

B.A. (Honours) Program

The B.A. (Honours) program in Geography is offered for students who wish to prepare for graduate study, a career in planning, government, business, or other specialization in which the field of geography offers the appropriate training. Information on recommended patterns of courses related to various interests is available from the department. There is substantial freedom in the program for students to take courses of special interest in the University, as well as courses in geography and related disciplines.

Formal concentrations are offered both in Environmental and Resource Assessment and in Physical Geography. Students interested in the acquisition, management, display and use of geographic information are directed to the B.A. in Geographic Information Processing (p. 261).

Students reading for a B.A. (Honours) degree must satisfy the general Faculty regulations for Honours. Fourth-year Honours students may take 0.5 credit listed in the *Graduate Studies and Research Calendar* only if they have a GPA of 9.0 in Geography and permission of the Department.

B.A. (Honours) in Geography

Students admitted to the B.A. (Honours) Geography program are required to complete 20.0 credits beyond the OSSD or Qualifying-University year in Arts or Social Sciences. At least 10.0 credits and not more than 12.0 credits must be in Geography, and must include:

1. 1.5 credits in Geography at the 100-level including:
 - (i) Geography 45.101 (recommended); or 45.102 ★ and 45.103 ★; or a First-Year Seminar in Geography;
 - (ii) Geography 45.110 ★ (may be taken in second year);
2. Geography 45.205 ★, 45.206 ★, and 1.0 credit selected from Geography 45.211 ★, 45.220 ★, and 45.230 ★;
3. Geography 45.300 ★ (or other approved field course) and 45.390 ★
4. Either (i) Geography 45.494 or (ii) 45.499;
5. At least 4.5 additional Geography credits above the 100-level of which at least 2.0 must be at the 300-level and at least 2.0 must be at the 400-level.

Note: a course in English writing and language (for example English 18.105) is recommended.

Geography Combined B.A.(Honours) program

The maximum number of credits allowed in the two subjects specified in a Combined B.A. (Honours) program is 15.0. Students taking Combined Honours in Geography and another subject are required to complete the equivalent of at least 7.0 credits and not more than 8.0 credits in Geography, which must include:

1. 1.5 credits in Geography at the 100-level including:
 - (i) Geography 45.101 (recommended); or 45.102 ★ and 45.103 ★; or a first-year seminar in Geography;
 - (ii) Geography 45.110 ★ (may be taken in second year);
2. 0.5 credit selected from 45.211 ★, 45.220 ★, and 45.230 ★;

3. Geography 45.205 ★, 45.206 ★, and 45.390 ★;

4. At least 2.5 additional Geography credits above the 100-level, 1.5 at the 300-level and 1.0 at the 400-level;

5. Either (i) Geography 45.494 or Geography 45.499 or (ii) an Honours research essay or equivalent in the other Honours department and an additional Geography credit at the 400-level. (If the other department does not offer an Honours research essay or equivalent research experience students must take either Geography 45.494 or 45.499).

Note: a course in English writing and language (for example English 18.105) is recommended.

Combined B.A. (Honours) in Biology and Geography

For Geography requirements see above; for Biology requirements see p. 144. Students must contact both departments for advice.

B.A. (Honours) in Geography with a Concentration in Physical Geography

Requirements: At least 10.0 credits and not more than 12.0 credits must be in Geography and must include:

1. Geography 45.101 (recommended); or 45.102 ★ and 45.103 ★;
2. 5.5 credits in physical geography as follows:
 - (i) Geography 45.110 ★, 45.212 ★, 45.302 ★, 45.446 ★ or 45.448 ★ (with a placement in physical geography);
 - (ii) 2.0 credits from Geography 45.311 ★, 45.312 ★, 45.313 ★, 45.315 ★, 45.318 ★, 45.319 ★;
 - (iii) 1.5 credits at the 400-level selected from Geography 45.404 ★, 45.405 ★ (with a topic in physical geography), 45.411 ★, 45.413 ★, 45.414 ★, 45.417 ★, 45.418 ★;
3. Geography 45.205 ★, 45.206 ★, and 0.5 credit selected from: 45.211 ★, 45.220 ★, or 45.230 ★;
4. Geography 45.300 ★ (or other approved field course) and 45.390 ★;
5. Geography 45.494 or 45.499 (with a topic in physical geography).

Note: a course in English writing and language (for example English 18.105) is recommended.

B.A. (Honours) in Geography with a Concentration in Resource and Environmental Assessment

The concentration in resource and environmental assessment provides an understanding of both the physical and human dimensions of resource issues and the environment. The concentration includes studies in related thematic areas of geography, as well as applied geography.

At least 10.0 credits and not more than 12.0 credits must be in Geography and must include:

1. Either Geography 45.101; or 45.102 ★ and 45.103 ★;
2. Geography 45.110 ★ (which may be taken in second year);
3. Geography 45.205 ★, 45.206 ★, and either 45.220 ★ or 45.230 ★;
4. 5.0 credits in resource and environmental assessment as follows:
 - (i) Geography 45.207 ★, 45.211 ★, 45.311 ★, 45.336 ★, 45.404 ★ and 45.446 ★ (or 448 ★)(with a placement in resource and environmental assessment);
 - (ii) 1.0 credit from: Geography 45.302 ★, 45.312 ★, 45.313 ★, 45.315 ★, 45.318 ★, 45.319 ★, 45.326 ★, 45.329 ★, 45.330 ★;
 - (iii) 1.0 further credit at the 400-level selected from Geography 45.405 ★ (with a topic in resource and environmental assessment), 45.411 ★, 45.414 ★, 45.418 ★, 45.430 ★, 45.440 ★, 45.445 ★, 45.447 ★.

Geography

5. Geography 45.300★ (or other approved field course), and 45.390★;

6. Geography 45.494 or 45.499 (with a topic in resources and environmental assessment);

Note: a course in English writing and language (for example English 18.105) is recommended.

B.A. Program

This program is offered for students who wish a liberal arts educa-

tion with emphasis in geography. Guidance on patterns of courses for particular interests is available from the Department.

Students admitted to the B.A. program in Geography are required to complete the equivalent of at least 7.0 credits and not more than 8.0 credits in Geography, which must include:

1. 1.5 credits in Geography at the 100-level including:

(i) Geography 45.101 (recommended); or 45.102★ and 45.103★; or a First-Year Seminar in Geography;

(ii) Geography 45.110★ (may be taken in second year);

Undergraduate Courses In Geography

45.101 Geoscience	45.101 Geography/ Environment	45.102★ World Issues I	45.103★ World Issues II	First Year Seminars: 01.109 Maps and Mapping; 01.110 It's Your Environment; 01.111 Location is Everything
PHYSICAL ENVIRONMENT	GEOGRAPHIC INFORMATION PROCESSING	CULTURE, SOCIETY, SOCIETAL CHANGE	REGIONAL AND INTEGRATIVE COURSES	
45.210★ The Physical Environment 45.211★ Environmental Geography	45.205★ Research 45.206★ Statistics 45.207★ Geographic Information Systems	45.220★ Global Economy 45.230★ Culture, Society 45.231★ Political	45.255★ Canada	
45.311★ Biophysical 45.312★ Geomorphology 45.313★ Hydrology 45.315★ Climatology 45.318★ Soils 45.319★ Soils	45.302★ Air Photos 45.303★ Quantitative Methods 45.304 Geospatial Analysis 45.307★ Cartographic Theory	45.320★ Canadian City 45.329★ Sustainability and Environment 45.335 Historical 45.336★ Resource Analysis 45.337★ Political 45.344★ Economic Restructuring 45.370★ Population	45.300★ Honours Field Course 45.301★ Social Geography Methods 45.330★ Sub-Saharan Africa 45.351★ Northern Lands 45.360★ Soviet Union Successor States 45.361★ Eastern Europe 45.362★ Southern Africa 45.390★ Geographic Thought/ Methodology 45.395★ Selected Region	
45.404★ Environmental Assessment 45.405★ Directed Studies 45.411★ Quaternary 45.412★ Tephra Analysis 45.413★ Hydrology 45.414★ Microclimatology 45.417★ Soil Mechanics 45.418★ Permafrost	45.403★ Remote Sensing 45.405★ Directed Studies 45.406★ Computer Cartography 45.408★ Advanced Topics in GIS 45.446★ Practicum I 45.448★ Practicum II	45.404★ Environmental Assessment 45.405★ Directed Studies 45.423★ Urban Revitalization 45.425★ Space, Place, Well-being 45.426★ Health, Environ- ment, Society 45.427★ Urban Development 45.430★ Environmental Movements 45.431★ Cultural 45.433★ Urban Planning 45.434★ Transport 45.435★ Historical 45.440★ Political 45.442★ Transport 45.443★ Applied Economic 45.445★ Rural Land Use 45.447★ Canadian Agriculture 45.460★ Post-Communist Societies	45.400★ Field Studies 45.405★ Directed Studies 45.446★ Practicum I 45.448★ Practicum II 45.496 Honours Research Project 45.498 Honours Research Workshop 45.499 Honours Research Essay	

★ denotes half-credit, usually given in one term.

2. Geography 45.205 ★ and 1.0 credit selected from Geography 45.211 ★, 45.220 ★, and 45.230 ★;

3. At least 4.0 additional Geography credits above the 100-level, of which at least 2.5 must be at the 300- or 400-level.

Note: a course in English writing and language (for example English 18.105) is recommended.

B.A. (Honours) Program in Geographic Information Processing (GIP)

This limited-enrolment program is for students who wish to focus on the acquisition, management, analysis, and display of geographic information. Various applications in planning, environmental and resources management, hazard mapping, demographics, market analysis, and education will be explored. Practical experience will be gained in geographic information systems (GIS), digital cartography, remote sensing, and quantitative analysis.

Admission Requirements

The minimum admission requirement is the OSSD or equivalent with an average of 75 percent or better, including at least six OACs.

Applications for admission to second or subsequent years should be made to the Registrarial Services office and they will be assessed on merit and subject to available space. Application deadlines are June 1 for September admission and November 1 for January admission. Students from other institutions should consult the admissions section of this Calendar for deadlines and procedures. (See p. 31.)

Admissibility to the program is dependent upon:

1. satisfying all Faculty regulations pertaining to B.A. (Honours) programs

2. the simple average of the GPA achieved in the Geographic Information Processing core course(s) completed at the time of application and the GPA achieved on all completed Geography courses.

Admission will be determined according to descending order of simple average attained in (2) above, until the full complement of places available, on an annual basis, has been filled.

The graduation average in Geographic Information Processing shall be calculated over all successfully completed, graded courses used to meet the minimum requirements of the degree program and counting towards the degree.

At least 10.0 credits and not more than 12.0 must be in Geography, and must include:

1. 1.0 credit in Geography at the 100-level. The First-year Seminar in Geography, 01.109, is recommended;

2. 45.205 ★, 45.206 ★, 45.207 ★, 45.302 ★, 45.303 ★, 45.305 ★, 45.306 ★, 45.307 ★, 45.403 ★, 45.406 ★, 45.408 ★, 45.446 ★ or 45.448 ★ (with placement in a GIP-related setting);

3. Geography 45.300 ★;

4. 1.5 additional credits in Geography at the 200-level or higher;

5. Geography 45.494 or 45.499, with an emphasis on the nature and/or use of Geographic Information Processing.

Note: a course in English writing and language (for example English 18.105) is recommended.

B.Sc. Programs in Geography

B.Sc. (Honours) Program

The Bachelor of Science (Honours) is offered in two concentrations, Physical Geography and Geographic Information Processing. The program consists of 20.0 credits beyond the OSSD or Qualifying-University Year Science, selected in a pattern approved by the Supervisor of the

B.Sc. Honours Studies in the Department of Geography and Environmental Studies, and consistent with the following requirements:

B.Sc. (Honours) Program Requirements

1. 8.0 credits in Geography selected from the list below, of which at least 2.0 credits must be at the 400-level.

(a) For the Honours Physical Geography concentration, these must include Geography 45.105, 45.212 ★, 45.311 ★, 45.312 ★, 45.313 ★, 45.315 ★ and 45.318 ★.

(b) For the Geographic Information Processing (GIP) concentration these must include 45.105, 45.205 ★, 45.206 ★, 45.207 ★, 45.302 ★, 45.303 ★, 45.305 ★, 45.306 ★, 45.307 ★, 45.403 ★, 45.406 ★, 45.408 ★.

In special cases students may take an appropriate graduate course in their fourth year, with permission of the Supervisor of Graduate Studies.

2. 45.496 Honours Project. For students in the GIP concentration, the project must have an emphasis on the nature and or use of geographic information processing.

3. (a) The remaining 11.0 credits for the Honours Physical Geography concentration must include:

(i) 1.0 approved credit in Biology, Chemistry or Physics.

(ii) 69.107 ★ and a 0.5 credit in Mathematics and/or Computer Science.

(iii) 2.0 approved credits in Science, not in Geography, beyond the 100-level.

(iv) 2.0 approved credits in Science, Computer Science or Engineering.

(v) 2.0 arts or social science credits, 1.0 of which must be an approved credit not in geography.

(vi) 3.0 free electives.

(b) The remaining 11.0 credits for the Geographic Information Processing concentration must include:

(i) 1.0 approved credit in Biology, Chemistry or Physics.

(ii) 2.0 approved credits Computer Science.

(iii) 2.0 approved credits in Science, not in Geography, beyond the 100-level.

(iv) 1.0 approved credit in Science, Computer Science or Engineering.

(v) 2.0 arts or social science credits, 1.0 of which must be an approved credit not in Geography.

(vi) 3.0 free electives.

Physical Geography and Geographic Information Processing Courses
45.105, 45.205 ★, 45.206 ★, 45.207 ★, 45.212 ★, 45.300 ★, 45.302 ★, 45.303 ★, 45.305 ★, 45.306 ★, 45.307 ★, 45.311 ★, 45.312 ★, 45.313 ★, 45.315 ★, 45.318 ★, 45.319 ★, 45.400 ★, 45.403 ★, 45.404 ★, 45.405 ★, 45.406 ★, 45.408 ★, 45.411 ★, 45.413 ★, 45.414 ★, 45.417 ★, 45.418 ★, 45.446 ★, 45.448 ★

Note: The Concentration in Geographic Information Processing has a limited enrolment. Procedures for application to the concentration and criteria for entry into, continuation in, and graduation from the concentration are the same as those for the B.A. Program - see above.

Combined Honours B.Sc. in Biology and Physical Geography

Program advisers are Lenore Fahrig and To be announced.

Students desiring a comprehensive basic education in both Biology and Physical Geography may apply to a Combined Honours B.Sc. program.

Geography

Applicants must satisfy entry requirements of the Honours B.Sc. program.

Course requirements of the Combined Honours B.Sc. program are as follows:

1. Biology 61.103 ★ and 61.104 ★, Geography 45.105, Mathematics 69.107 ★ and 69.117 ★ or 69.257 ★, Chemistry 65.100.
2. 2.0 optional arts or social science credits. 1.0 credit in Geography, other than the Physical Geography courses on this page is recommended.
3. 1.0 additional Science credit from the list on p. 118 (Physics 75.101 ★ and 75.102 ★, or 75.107 ★ and 75.108 ★ is required unless OAC Physics is presented as an entrance credit).
4. 1.0 free option credit (unless Biology 61.102 is taken in lieu of the OAC in Biology. See Biology program for entry with and without OAC in Biology).
5. 10.0 credits in Biology (or Biochemistry) and Physical Geography (see preceding list of courses) beyond First-year level, including at least 0.5 credit involving a field course. Not more than 6.0 credits in this group should be taken in one department and not more than 6.0 may be at the 200-level.
6. 1.0 additional credit in Science or Computer Science above the 100-level, not in Biology or Geography and chosen in consultation with the students program adviser.
7. Biology 61.498 (requires 61.491 ★ as a prerequisite, or may be taken concurrently), or Geography 45.496.

Combined Honours B.Sc. in Geology and Physical Geography

Program advisers are F. Michel and To be announced.

A grade of C+ or better in Geography 45.105/Geology 67.105† and overall Honours standing are required for admittance to the program. Program requirements are as follows:

1. Geography 45.105 or Geology 67.105†, Chemistry 65.100, Mathematics 69.107 ★ and 69.117 ★ and Physics 75.101 ★ and 75.102 ★, or 75.107 ★, and 75.108 ★;
2. 5.0 credits in Geology beyond First-year level, including Geology 67.223 ★, 67.225 ★, 67.228 ★, 67.285 ★††, 2.0 credits in Geology at the 300-level or above, and 1.0 credit in Geology at the 400-level.
3. 5.0 credits in Physical Geography beyond First-year level from list on p. 241, to include: Geography 45.212 ★, 1.5 credits in Physical Geography at the 200-level or above, Geography 45.302 ★, 45.312 ★, 45.315 ★, 45.318 ★ and 1.0 credit in Physical Geography at the 400-level;
4. Geography 45.496 or Geology 67.498;
5. 1.0 credit in Mathematics beyond First-year level and/or Computer Science. (Mathematics 69.257 ★ and Computer Science 95.104 ★ are recommended.)
6. 2.0 arts or social science elective credits†††;
7. 2.0 credits chosen from arts, social science, Science or Engineering.

† Students who have taken Geology 67.100 may substitute, with permission of the program advisers, Geology 67.100 for 67.105/45.105.

†† Geology 67.285 ★

††† A Human Geography course is recommended in the program.

Combined Honours in Geology and Geography: Concentration in Terrain Science

(Please see entry under Earth Sciences, p. 214).

Minor in Geography

Students registered in degree programs other than Geography may complete a Minor in Geography. Application for admission to the Minor must be made to the Registrarial Services Office. For the designation "Minor in Geography" to be added to the student's transcript and diploma the requirements below must be met.

At least 4.0 credits in Geography (with a GPA of 4.0 or better) including:

1. Either Geography 45.101; or 45.102 ★ and 45.103 ★;
2. Geography 45.205 ★; 45.110 ★; 45.220 ★ or 45.230 ★;
3. 1.5 credits further credits in Geography, including at least 1.0 credit at the 300-level.

Minor in Geography: Physical Geography

Students registered in degree programs other than Geography may obtain a Minor in Geography: Physical Geography. Application for admission to the Minor must be made to the Registrarial Services Office. For the designation "Minor in Geography: Physical Geography" to be added to the student's transcript and diploma the requirements below must be met.

4.0 credits in Physical Geography (with a G.P.A. of 6.5 or better) including:

1. Geography 45.110 ★, 45.212 ★;
2. 3.0 credits selected from: Geography 45.302 ★, 45.311 ★, 45.312 ★, 45.313 ★, 45.315 ★, 45.318 ★, 45.319 ★, 45.411 ★, 45.414 ★, 45.418 ★.

Minor in Geography: Resource and Environmental Assessment

Students registered in degree programs other than Geography may obtain a Minor in Geography: Resource and Environmental Assessment. Application for admission to the Minor must be made to the Registrarial Services office. For the designation "Minor in Geography: Resource and Environmental Assessment" to be added to the student's transcript and diploma the requirements below must be met.

4.0 credits in Resource and Environmental Assessment (with a G.P.A. of 6.5 or better) including:

1. Geography 45.102 ★, 45.211 ★, 45.311 ★, 45.319 ★, 45.336 ★, 45.404 ★;
2. 1.0 credit selected from: Geography 45.302 ★, 45.312 ★, 45.313 ★, 45.315 ★, 45.318 ★; 45.326 ★, 45.329 ★, 45.330 ★, 45.411 ★, 45.414 ★, 45.418 ★, 45.430 ★, 45.440 ★, 45.445 ★, 45.447 ★.

Minor in Geographic Information Processing

Application for admission to this Minor must be made through the Registrarial Services office after having completed at least 1.0 credit from the Geographic Information Processing courses listed below with a GPA of 6.5 or better. The deadline for application is June 1 for September admission and November 1 for January admission. For the designation "Minor in Geographic Information Processing" to be added to the student's transcript and diploma the requirements below must be met.

4.0 credits in Geographic Information Processing (with a GPA of 6.5 or better) including:

1. 45.205 ★ and 45.206 ★ (students in Science may substitute Mathematics 69.257 ★ for 45.206 ★);
2. Geography 45.207 ★, 45.305 ★;
3. 2.0 credits chosen from Geography 45.302 ★, 45.303 ★, 45.306 ★, 45.307 ★, 45.403 ★, 45.406 ★ or 45.408 ★.

Note: Familiarity with computers is assumed but not required. Students with little computer experience may wish to take one of the following courses as part of their program of study: Business 42.142★, Computer Science 95.101★ or 95.104★.

Graduate Programs

The Department of Geography and Environmental Studies offers graduate programs in human geography, physical geography and geotechnical science. For further details consult the *Graduate Studies and Research Calendar*.

Requirement for Breadth, for students in B.A. or B.A.(Honours) degrees

Category for Breadth	Courses in this unit
The temporal dimension of human societies, analyzing times before the present era or societies other than our own	(45.)103★, 230★, 330★, 335, 351★, 360★, 362★, 363★
The artifacts of the imagination in literature and/or other forms, or that addresses the life of the imagination and culture.	
The understanding of social, technological and/or natural processes and the ways in which that understanding is obtained in science and social science.	All Geography courses not listed in any other category
Matters of human values, ethics and social responsibilities	

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

First-Year Seminar in Geography 01.109

Maps and Mapping

An examination of our spatial perspective of the world; the evolution of cartography and mapping. Field mapping techniques, data acquisition and map production principles; the interface with geographic information processing fields. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar in Geography 01.110

It's Your Environment

The causes and consequences of environmental change; emphasis on the interactions of nature and human behaviour. Ways in which the environment can be protected and restored. Environmental issues that affect our own communities. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar in Geography 01.111

Location is Everything

Where we live affects who we are; the role of geographic location and environment on human perception, behaviour, and well-being, viewed at scales ranging from local to global; methods of collecting and interpreting information about location. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

Geography 45.101

Geography and the Environment

Human activity and the physical environment and links between them. Social, economic, cultural, and political forces shaping human activity at scales ranging from local to global. Methods of collecting and interpreting geographic information.

Lectures two hours a week and workshops/discussions one hour a week.

Geography 45.102★

World Issues I: Environment, Resources and Society

Global and regional issues through study of: geographic and environmental traditions; world views; ecosystem structure and function; biodiversity; atmosphere, climate and greenhouse effect; population and demography; food and nutrition; water; soil; agriculture; renewable and non-renewable resources; waste; environmental degradation; sustainability; environmental management and development.

Lectures two hours a week, discussions one hour a week.

Geography 45.103★

World Issues II: Territory, Culture, and Political Space

Contemporary global and regional issues in which elements of political and cultural geography are central; reference to the local region, Canada, and topical overseas examples; focus on nation-state integration and fragmentation.

Lectures three hours a week.

Geography 45.105

Introduction to Geoscience

Earth's physical environment; processes operating within the Earth and at its surface: the hydrologic cycle, oceans, earth structure, tectonics, rocks, minerals, history of life on the earth, climatic change, soils, landforms and resources. (Also listed as Geology 67.105.)

Precludes additional credit for Geology 67.100 and Geography 45.110★.

Lecture three hours a week, laboratory three hours a week, a field excursion.

Geography 45.110★

The Physical Environment

A survey of the form and processes operating in the Earth-atmosphere system. Earth structure and tectonics; weather, climate, and climate change; soils and landform development; the hydrologic cycle.

Precludes additional credit for Geography 45.105 (67.105) and 45.210★.

Lectures two hours a week, laboratory two hours a week, and a field excursion.

Geography 45.205★

Geographic Research

Nature of primary and secondary sources of geographic data; research questions, processes and ethics; maps and mapping; quantitative and qualitative approaches such as surveys, interviews, participant observation, case studies; information summary and presentation in textual, statistical, graphic, and cartographic form.

Precludes additional credit for Geography 45.204.

Prerequisite: 1.0 credit in Geography at the 100-level and Second-year standing, or permission of the Department.

Lectures two hours a week, laboratory two hours a week.

Geography 45.206★

Geographic Statistics

Probability; sampling design; estimation; inferential statistics; spatial and temporal statistics.

Precludes additional credit for Geography 45.204, Mathematics

69.257 ★, 69.266 ★, Economics 43.220, Psychology 49.200, Political Science 47.270.

Prerequisite: Geography 45.205 ★ or permission of the Department.

Lectures two hours a week, laboratory two hours a week.

Geography 45.207 ★

An Introduction to Geographic Information Systems

Data in a spatial context; spatial data structures, georeferencing, data query; mapping; creating spatial databases; selected topics in GIS application to environmental, land-use planning and market analysis issues.

Prerequisite: Geography 45.204, or 45.206 ★ (may be taken concurrently) or permission of the Department. Familiarity with personal computers is assumed.

Workshop three hours a week.

Geography 45.211 ★

Environmental Geography

Biophysical elements of the environment; human-environment interactions; natural hazards; human response to environmental change and variation; land-use planning and risk management.

Prerequisite: 1.0 credit in Geography at the 100-level, or Second-year standing.

Lectures two hours a week, laboratory two hours a week.

Geography 45.212 ★

Physical Environments of Canada

The physiography, climates, biogeography, soils, and landforms of Canada.

Prerequisite: Geography 45.110 ★ or Geography 45.105/Geology 67.105.

Lectures two hours a week, laboratory two hours a week.

Geography 45.220 ★

Global Change: Economy, Culture, and Environment

Economic and cultural globalisation, global environmental change, and the linkages between them. Global-local interactions. Economic and environmental sustainability. Natural resources and industrial systems in the global economy. Culture, politics, and the global environment.

Prerequisite: 1.0 credit in Geography at the 100-level, or Second-year standing.

Lectures three hours a week.

Geography 45.230 ★

Culture, Society and Space

Ways in which individuals and societies create, modify, and interact with environments; social dimensions of landscapes; the culture and politics of space; geographies of identity.

Prerequisite: 1.0 credit in Geography at the 100-level (Geography 45.101 is recommended), or Second-year standing.

Lectures two hours a week, discussion one hour a week.

Geography 45.255 ★

Canada: Contemporary Geographic Issues

Analysis and interpretation of Canada, its regions and localities, using a range of geographical concepts; interactions among society, the economy and the environment, and related policy issues.

Precludes additional credit for Geography 45.305 ★ (taken before 1998-99) and 45.355 ★.

Prerequisite: Second-year standing or permission of the Department.

Lectures two hours a week, discussion one hour a week.

Geography 45.300 ★

Honours Field Course and Tutorial

Geographical techniques of field observation, measurement, recording, and analysis involving work in groups, normally in the Ottawa region. Development of research, writing, and thinking

skills in a tutorial setting. A supplementary charge may apply. Prerequisite: Third-year Honours standing in Geography, or permission of the Department.

A four-day field camp, tutorial one hour a week.

Geography 45.301 ★

Social Geography Methods

Methods of acquiring, analyzing and presenting primary information relating to contemporary issues in social geography; technical and ethical aspects of such topics as: mental mapping, sampling and questionnaire design, participant observation and interviewing, discourse analysis, and qualitative research methods.

Prerequisite: Geography 45.204 or 45.205 ★.

Lectures two hours a week, discussion group one hour a week.

Geography 45.302 ★

Air Photo Interpretation and Remote Sensing

Aerial photography and remote sensing; visual image interpretation of landforms, surface materials, and cultural features; elements of photogrammetry and flight planning; digital multispectral image analysis.

Prerequisite: Third-year standing, or permission of the Department.

Lectures two hours a week, laboratory two hours a week.

Geography 45.303 ★

Quantitative Geography

Multivariate quantitative methods, such as multiple correlation and regression, factor analysis, cluster analysis, discriminant analysis, and analysis of variance as applied to classification, regionalization, explanation and hypothesis testing in geographical research.

Prerequisite: Geography 45.204 or 45.206 ★, or permission of the Department.

Lectures two hours a week, laboratory two hours a week.

Geography 45.305 ★

Geospatial Analysis

Acquisition, manipulation, and display of spatially referenced information using Geographic Information Systems (GIS). Spatial modeling, site selection, and routing analysis in raster and vector GIS.

Precludes additional credit for Geography 45.304.

Prerequisite: Geography 45.207 ★

Workshop three hours a week.

Geography 45.306 ★

Applications of Geographic Information Systems

Project design and customization, digital atlas compilation and geomatics education.

Precludes additional credit for Geography 45.304.

Prerequisite: Geography 45.305 ★

Workshop three hours a week.

Geography 45.307 ★

Cartographic Theory and Design

Principles of cartography, cartographic communication and map design; practical work designed to provide experience in solving problems of cartographic representation.

Precludes additional credit for Geography 45.324 ★ and 45.325.

Prerequisite: Geography 45.204 or 45.205 ★, and Third-year standing, or permission of the Department.

Lectures and laboratory three and a half hours a week.

Geography 45.311 ★

Biophysical Resource Assessment

The acquisition and interpretation of biophysical information, with regard to defining limitations on the use of the environment; field and laboratory techniques with an emphasis on the biophysical resources of a local area. A supplementary charge may apply.

Prerequisite: One of Geography 45.105/Geology 67.105, 45.210 ★, 45.211 ★ or permission of the Department.

Lectures, laboratory and fieldwork five hours a week.

Geography 45.312★

Geomorphology

Geomorphological agents of landscape change at the Earth's surface, emphasizing the role of water, ice and wind in erosion and deposition; use of geomorphic indicators in studies of environmental change.

Prerequisites: Geography 45.105/Geology 67.105, or Geography 45.210★ and Third-year standing, or permission of the Department.

Lectures two hours a week, laboratory two hours a week, one field excursion.

Geography 45.313★

Watershed Hydrology

Principles of hydrology at local and watershed scales, with an emphasis on: soil moisture regimes; field data collection and analysis of surface water or snow and ice conditions; hydrologic processes in cold environments; and regional runoff regimes in Canada. A supplementary charge may apply.

Prerequisite: Geography 45.210★ or 45.211★.

Note: First-year mathematics and physics are recommended.

Lectures two hours a week, laboratory three hours a week, two field excursions, including a two-day excursion. Students are responsible for long-distance transportation, food and lodging costs associated with the field excursions.

Geography 45.315★

Climate and Atmospheric Change

The global climate system, with emphasis on global change variability over the historical and modern periods; the changing composition of the atmosphere and its impact on climate; analysis and interpretation of climatic and atmospheric data; modelling of climate systems.

Prerequisites: Geography 45.206★ or 45.204, and 45.210★; or permission of the Department.

Lecture two hours a week, laboratory two hours a week.

Geography 45.318★

Soil Properties

The physical and chemical properties of soils; soil-water relationships, weathering processes, soil mineralogy, cation exchange, soil pH. A plant-oriented perspective predominates.

Precludes additional credit for Geography 45.308.

Prerequisite: Geography 45.105, or 45.210★, or permission of the Department.

Lectures and laboratory five hours a week.

Geography 45.319★

Soils and Environment

The formation and development of soils, soil classification, soil fertility, soils and environmental concerns, land degradation.

Precludes additional credit for Geography 45.308.

Prerequisite: Geography 45.318★, or permission of the Department.

Lectures three hours a week.

Geography 45.320★

The Canadian City: Environment, Structure and Contemporary Problems

Internal structure of the Western city with specific application to Canadian cities; current urban problems with particular focus on inner city revitalization, peripheral expansion, metropolitan organization and transportation systems and their interaction with land use.

Prerequisite: Geography 45.220★ or permission of the Department.

Lectures three hours a week.

Geography 45.326★

Health, Environment, and Society

Factors influencing human health in an ecological framework involving population structure, habitat, and behaviour. Changes in

the distribution of communicable and degenerative diseases are portrayed as being related to historical and contemporary development and globalisation processes. Sources, types and characteristics of geographically referenced health information.

Precludes additional credit for Geography 45.426★.

Prerequisite: Third-year standing

Lectures three hours a week.

Geography 45.329★

Sustainability and Environment in the South

A political ecology approach to the concept of sustainability in the South; case studies from Africa, Asia, and Latin America to analyze the relationship between people and the environment at scales ranging from the intra-household and local to the international.

Prerequisite: Third-year standing and Geography 45.220★ or 45.230★ or 45.231★; or permission of the Department.

Lectures two hours a week, discussion groups one hour a week.

Geography 45.330★

Environment and Sustainability in Sub-Saharan Africa

Historical analysis of contemporary problems faced by selected states in sub-Saharan Africa, focusing on environmental sustainability in the context of political, social and economic change, at scales from the intra-household and local to national.

Prerequisite: Third-year standing or permission of the Department.

Lectures three hours a week.

Geography 45.335

The Development of Canada: The Historical Geographical Perspective

Canada from pre-history to the present; issues of culture and economy in a geographical context; methodology in historical geography.

Prerequisite: Geography 45.230★ or History 24.233 or 24.234; or permission of the Department.

Lectures three hours a week.

Geography 45.336★

Resource Analysis in Geography

Human dimensions of resource assessment, use and management; topics relating to resource allocation theory and methods, carrying capacity, environmental and social impact assessment, public participation and resources policies; emphasis on Canadian case studies.

Precludes additional credit for Geography 45.333★ and 45.334★.

Prerequisite: At least Third-year standing in Geography or Environmental Studies or Environmental Science, or permission of the Department.

Lectures and laboratory three hours a week.

Geography 45.337

Contemporary Geopolitics

Geographical understandings of power and conflict at the global scale; geographical discourses of peace and violence in the contemporary world system, critical perspectives on the world political map, geographical patterns of inequity and global order.

Prerequisites: Third-year standing

Lecture three hours a week.

Geography 45.344★

Economic Geography

Geography of production, marketing, and consumption. Locational decision making in the private and public sectors with particular reference to manufacturing and service industries.

Prerequisite: Geography 45.220★ or permission of the Department

Lectures three hours a week.

Geography 45.351★

Northern Lands

The physical characteristics, historical geography, economic resources,

settlement patterns and problems and the future development of Arctic and Subarctic lands, focusing primarily on Canada.
Prerequisite: Third-year standing or permission of the Department.
Lectures three hours a week.

Geography 45.360 ★

The Soviet Union and Successor States: A Geographic Survey
A general review of the physical, social and economic geography of the Soviet Union and successor states, with detailed analyses of selected topics related to social and population conditions, resources development and environmental problems, including comparisons with North America.

Prerequisite: Third-year standing.

Offered in alternate years to Geography 45.361 ★.

Lectures three hours a week.

Geography 45.362 ★

Geography of Southern Africa

Broad geographical coverage of the subcontinent from Zambia southwards with particular reference to the environmental, historical, economic, cultural and political dimensions necessary to understand the contemporary context of and around South Africa.

Precludes additional credit for Geography 45.395 ★ (if taken in 1990-1994).

Prerequisite: Third-year standing or permission of the Department.

Lectures three hours a week.

Geography 45.363 ★

Geography of Europe

Systematic geographic survey of Europe with particular reference to historical, cultural, economic, political, resource, and environmental dimensions.

Prerequisite: Third-year standing or permission of the Department.

Lectures three hours a week.

Geography 45.370 ★

Population Geography

The distributional aspects of population attributes; areal patterns of population characteristics and their spatial variations associated with differences in the nature of places; migratory movements within the framework of spatial models of interactions between locations.

Prerequisite: Either Geography 45.220 ★ or 45.230 ★ or permission of the Department.

Lectures three hours a week.

Geography 45.390 ★

Geographic Thought and Methodology

Debate about the nature of geography and what geographers do; frameworks for understanding the discipline; debates within physical, environmental, and human geography and the connections among them.

Prerequisite: Third-year Honours Geography standing.

Lectures two hours a week, discussion one hour a week.

Geography 45.395 ★

Selected World Regional Problems

Geographical analysis of topical problem areas in the world community. The region of study in 1998-99 will be Europe.

Prerequisite: Third-year standing or permission of the Department.
Lectures three hours a week.

• 400-level courses are normally restricted to students with Fourth-year Honours standing. However, a student with Third-year standing may take 400-level courses provided the student has the necessary prerequisites, a Geography GPA of 6.5 or better, and permission of the Department.

Geography 45.400 ★

Field Studies

Field observation and methodology in a selected region; individual or group basis.

Prerequisite: Permission of the Department.

Hours to be arranged.

Geography 45.403 ★

Remote Sensing of the Environment

Primary optical and radar remote sensing systems; image processing for feature enhancement and thematic mapping using high level image analysis software; applications in forestry, agriculture, geology, urban map updating, and integration of remote sensing with other spatial data.

Prerequisites: Geography 45.302 ★ and Honours standing; or permission of the Department.

Lectures two hours a week, laboratory two hours a week.

Geography 45.404 ★

Environmental Impact Assessment

Principles, scope and purpose of environmental impact assessment, from conceptual and methodological points of view; range of environmental issues with an emphasis on primarily Canadian case studies.

Prerequisite: Fourth-year Honours standing in Geography or Environmental Studies or Environmental Science, or permission of the Department.

Note: Geography 45.311 ★ or 45.336 ★ is recommended.

Lectures and seminars three hours a week.

Geography 45.405 ★

Directed Studies in Geography

Students pursue their interest in a selected theme in geography on a tutorial basis with a member of the Department.

Precludes additional credit for Geography 45.401 ★ and 45.402 ★.

Prerequisites: Fourth-year Honours standing in Geography and permission of the Department.

Geography 45.406 ★

Analytical and Computer Cartography

Theoretical and practical approaches to analytical and computer cartography, with an emphasis on digital mapping algorithms using microcomputers.

Precludes additional credit for Geography 45.326 ★.

Prerequisites: Geography 45.307 ★ (or equivalent), and Fourth-year Honours standing; or permission of the Department. Basic mathematical skills (linear algebra, geometry, and trigonometry) and knowledge of data processing are assumed.

Lectures and laboratory three hours a week.

Geography 45.408 ★

Advanced Topics in Geographic Information Systems

Advanced methods and techniques in GIS applications including: positional and attribute error analysis, multiple criteria decision making, interpolation, elevation modelling and ortho-imaging, and spatial pattern measurement.

Prerequisites: Geography 45.304 and Honours standing in Geography.

Lectures two hours a week, laboratory two hours a week.

Geography 45.411 ★

Quaternary Geography

Changes in the physical environment of the earth during the last two million years; methods of studying recent earth history; the last ice age in Canada. (Also listed as Geology 67.415 ★.)

Prerequisites: Geography 45.315 ★ or permission of the Department.

Note: Geography 45.312 ★ and Geology 67.332 ★ are recommended.
Lectures three hours a week.

Geography 45.413 ★

Water Resources Engineering

A quantitative analysis of natural water systems and the development of these systems, as a resource, by society. Distribution of water resources in Canada, descriptive and quantitative hydrology, groundwater, probability concepts in water resources, optimization of water resource utilization, water distribution and pipe networks. (Also listed as Engineering 81.303 ★.)

Prerequisites: Engineering 86.230 ★ and 82.328 ★, or permission of the Department.

Lectures three hours a week, problem analysis one hour a week.

Geography 45.414 ★

Microclimatology

The formation of microclimates near the Earth's surface; energy and water flows; the interaction of atmospheric processes with the physical properties of surfaces.

Prerequisite: Geography 45.315 ★ or permission of the Department.

Lectures three hours a week.

Geography 45.417 ★

Geotechnical Mechanics

Soil composition and soil classification. Soil properties, compaction, seepage and permeability. Concepts of pore water pressure, capillary pressure and hydraulic head. Principle of effective stress, stress-deformation and strength characteristics of soils, consolidation, stress distribution with soils, and settlement. Laboratory testing. (Also listed as Engineering 82.328 ★, Geology 67.417 ★.)

Precludes additional credit for Geography 45.424 ★.

Prerequisites: Geology 67.244 ★ or equivalent and Third-year registration, or permission of the Department.

Lectures three hours a week, laboratory three hours alternate weeks.

Geography 45.418 ★

Permafrost

Distribution, development, and degradation of permafrost in Canada; thermal and hydrologic regime of permafrost terrain; development of landforms in permafrost regions; geotechnical consideration in northern construction.

Prerequisite: Geography 45.318 ★ or permission of the Department.

Lectures three hours a week.

Geography 45.423 ★

Urban Revitalization

Recent revitalization of inner cities from an internationally comparative perspective; residential, commercial and institutional dimensions of revitalization, with particular reference to waterfronts and to heritage conservation issues.

Prerequisites: Geography 45.320 ★ and Fourth-year Honours Geography standing, or permission of the Department.

Seminar three hours a week; optional residential field week.

Geography 45.427 ★

Urban Development and Analysis

The relationship between changes in urban development and geographic theory, emphasizing contemporary critical perspectives on selected urban issues.

Prerequisite: Fourth-year Honours Geography standing or permission of the Department.

Seminar three hours a week.

Geography 45.428 ★

Geographical Analysis of Health Information

Integration of theory and application through (1) extensive, quantitative methods of analysing geographical data on disease and (2) intensive, qualitative methods of producing primary information on health, space, and place.

Prerequisites: Geography 45.301 ★ (or Sociology 53.203/Anthropology 54.203), 45.303 ★, and 45.326 ★, and Fourth-Year Honours standing in Geography or Environmental Studies, or permission of the Department.

Lecture two hours a week, laboratory two hours a week.

Geography 45.430 ★

Comparative Environmental Movements

The emergence of contemporary, locally-based, environmental movements in Canada, Africa, Asia, and Latin America. Case studies to analyze local environmental action in relation to the broader political economy and long term sustainability of land use.

Prerequisites: Fourth-year Honours standing and 45.329 ★ or 45.330 ★ or permission of the Geography Department.

Seminar three hours a week.

Geography 45.431 ★

Advanced Cultural Geography

Cross-cultural thematic examination of territorial organization, territoriality, mental maps, geographies of the mind, and landscape impact of authority and ideology. Regional emphasis on Canada.

Prerequisite: Geography 45.230 ★ or permission of the Department.

Seminar three hours a week.

Geography 45.433 ★

Urban Planning

A systematic approach to urban planning; urban sprawl; data collection; forecasting; standards; space requirements; land use; zoning; transportation; land development; site selection; land capability; layout; evaluation; housing; urban renewal and new towns. (Also listed as Engineering 82.433 ★.)

Prerequisite: Third-year registration, or permission of the Department.

Lectures three hours a week, problem analysis three hours alternate weeks.

Geography 45.434 ★

Transportation Engineering and Planning

Transportation and the socio-economic environment; modal and intermodal systems and components; vehicle motion; human factors, system and facility design; traffic flow; capacity analysis; planning methodology; environmental impacts; evaluation methods. (Also listed as Engineering 82.334 ★.)

Prerequisite: Third-year registration, or permission of the Department.

Lectures three hours a week, problem analysis three hours alternate weeks.

Geography 45.435 ★

Historical Geography

The relation of geography and history, the use of field techniques, primary documents, model building and statistical methods in historical geography. Emphasis on Ontario and local studies. Also offered at the graduate level, with additional or different requirements, as Geography 45.545, for which additional credit is precluded.

Prerequisite: Geography 45.335 or permission of the Department.

Seminar three hours a week.

Geography 45.440 ★

Environmental Geopolitics

Environment and conflict in geopolitical perspective, ecological change and security policies of the industrial world, the geography of environmental threats, the political consequences and world order implications of environmental degradation and environmental refugees.

Prerequisites: Fourth-year Honours standing and two of Geography 45.211 ★, 45.220 ★, 45.337 ★, or permission of the Department.

Seminar three hours a week.

Geography 45.441 ★

Geographies of Globalization

Theories of globalization in geographic perspective; local consequences of global processes, interconnections and patterns of social, economic, environmental, political and cultural change.

Prerequisites: Fourth-year Honours standing.

Seminar three hours a week.

Geography 45.443 ★

Issues in Applied Economic Geography

Selected topics drawn from a variety of areas of concern, such as marketing, trade, investment, manufacturing, the high technology sector, and services.

Prerequisite: Geography 45.344 ★ or permission of the Department.

Lectures and seminars three hours a week.

Geography 45.445 ★

Rural Land Use Analysis

Rural land use issues from physical and socio-economic perspectives, contemporary methods for rural land use evaluation; rural land use policies.

Prerequisite: Geography 45.336 ★ and Fourth-year Honours standing, or permission of the Department.

Lectures and seminars three hours a week.

Geography 45.446 ★

Practicum in Geography I

Experience in an employment environment through field placement. Observation and involvement in issues and research methods used by professional geographers.

May be taken for credit in addition to Geography 45.448 ★.

Prerequisites: Fourth-year Honours standing in Geography and permission of the Department.

Field placement one day a week.

Geography 45.447 ★

Canadian Agriculture

Trends in farm organization and production; issues arising from farmings relationships to the physical resource base, land market pressures, government policies and regulations, and agribusiness and marketing organizations.

Precludes additional credit for Geography 45.443 ★ (if taken in 1994-95).

Prerequisites: Geography 45.255 ★ or 45.336 ★ and Fourth-year Honours standing, or permission of the Department.

Lectures and seminars three hours a week.

Geography 45.448 ★

Practicum in Geography II

Experience in an employment environment through field placement. Observation and involvement in issues and research methods used by professional geographers. May be taken for credit in addition to Geography 45.446 ★.

Prerequisites: Fourth-year Honours standing in Geography and permission of the Department.

Field placement of one day a week.

Geography 45.460 ★

The Changing Geography of Post-Communist Societies

Geographical dimensions of political and economic transition in the post-communist societies of Eastern Europe and the former U.S.S.R. Topics may include environmental degradation, resource management, population, quality of life, industrial restructuring and regional development, urban and rural changes, energy, transportation, and foreign trade.

Prerequisites: Fourth-year Honours standing, Geography 45.360 ★ or 45.361 ★ or permission of the Department.

Lectures and seminars three hours a week.

Geography 45.494

Honours Research Workshop and Tutorial

Advanced training in research design, data collection and analysis, report writing and oral presentations in workshop and tutorial settings; undertaking of an individual research project and preparation of a major report on a selected topic normally on the National Capital Region.

Precludes additional credit for Geography 45.491 ★, 45.492 ★, 45.498, and 45.499.

Prerequisite: Fourth-year Honours standing in Geography.

Workshop/seminar/tutorial three hours per week.

Geography 45.496

Honours Research Project

Candidates for B.Sc. with Honours in Geography undertake a research project based on a laboratory or field problem. The project is supervised by a member of the department and a written report must be submitted. The candidate may be examined orally on the report.

Prerequisite: Fourth-year Honours standing in Geography.

Hours to be arranged.

Geography 45.499

Honours Research Essay

A student in the Fourth year of B.A. (Honours) or Combined B.A. (Honours) in Geography may write an Honours essay or equivalent. The essay counts as the equivalent of 1.0 credit. Students work under an individual faculty adviser. The subject for research is decided upon in consultation with the supervisor.

Prerequisites: Fourth-year Honours standing in Geography, a Geography GPA of 8.0 or better, an approved research topic, and permission of the Honours supervisor.

Hours to be arranged with faculty adviser.

School of Languages, Literatures and Comparative Literary Studies

German

(Arts and Social Sciences)

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Adjunct Research Professor

Joseph B. Dallett

Adjunct Professor

Basil Mogridge, M.A., Ph.D. (Cambridge)

General Information

Students currently enrolled in degree programs offered by the Discipline of German are governed by the requirements contained in the 1997-98 Undergraduate Calendar.

Minor in German

A Minor in German requires 4.0 credits in German, with a GPA of 6.5 or better, chosen from the list below; in consultation with the German section:

22.115, 22.205 (22.120 may be taken in place of 22.115 and 22.205), 22.209 ★, 22.213, 22.240, 22.301 ★, 22.302 ★, 22.402 ★, 22.403 ★

At least 2.0 credits in the Minor must be completed at Carleton.

Requirement for Breadth, for students in B.A. or B.A.(Honours) degrees

Category for Breadth	Courses in this unit
The temporal dimension of human societies, analyzing times before the present era or societies other than our own	
The artifacts of the imagination in literature and/or other forms, or that addresses the life of the imagination and culture.	All courses in German
The understanding of social, technological and/or natural processes and the ways in which that understanding is obtained in science and social science.	
Matters of human values, ethics and social responsibilities	

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

German 22.115

Introductory German

A beginners' course designed to give a sound grasp of the fundamentals of present-day German. The facilities of the Language Learning Resource Centre and computer-assisted language instruction are available for both on-campus and off-campus use.

Lectures two hours a week and workshops two hours a week.

German 22.118

Reading German

A course for beginners interested in the rapid acquisition of a reading knowledge of German. Grammar; use of dictionaries; basic vocabulary. Taught in English.

Seminar four hours a week.

German 22.120 (2.0 credits)

Intensive Introductory German

An intensive course designed to enable students with little or no previous knowledge of German to reach in one year the level of proficiency normally attained over two years in German 22.115 and 22.205.

Prerequisite: Permission of the School.

Lectures four hours a week and four hours seminar a week.

German 22.205

Intermediate German A

The course takes students from successful completion of the elementary course to a stage where they can use German in a variety of situations. Emphasis on reading and writing but including oral work.

Prerequisite: German 22.115 or 22.118; or equivalent.

Seminar four hours a week.

German 22.206

Intermediate German B

Designed for students with a higher-than-average standing on the elementary level, or with several years of high school or equivalent

background, this course takes students to a stage where they can use German in a variety of situations.

Prerequisite: Standing of B+ or better in German 22.115 or equivalent.

Seminar four hours a week.

German 22.209 ★

Spoken German

A course to develop increased proficiency in spoken German. Oral comprehension and systematic enlargement of vocabulary. Practice in the effective presentation of arguments and reports.

Prerequisite: German 22.120 or 22.205 or 22.206; or permission of the School. (This course is not open to native speakers of German.)

Seminar three hours a week and one hour language laboratory a week.

German 22.211 ★

Descriptive Analysis of Contemporary German Vocabulary

Patterns of German word formation and their interaction with syntactic structures. Analysis of text samples from various written sources; some practice in writing short essays in German.

Prerequisite: German 22.120 or 22.205 or 22.206, or permission of the School.

Lectures three hours a week.

German 22.213

Written German: Analysis and Practice

A course parallel to German 22.209 ★ and emphasizing effective communication in written German. Explication of grammatical patterns and sentence structure in the light of current linguistic theory. Text analyses and practice in structured writing.

Precludes additional credit for German 22.210 ★ and 22.212 ★.

Prerequisite: German 22.120 or 22.205 or 22.206, or permission of the School.

Seminar three hours a week.

German 22.240

An Introduction to Literary Reading

An introduction both to representative works of German literature (to be read in German), and to the informed discussion of literary texts, including narrative fiction, poetry and drama.

Prerequisite: German 22.118 or 22.120 or 22.205 or 22.206 or 22.213; or permission of the School.

Seminar three hours a week.

German 22.301 ★

Advanced Spoken German

Practice of oral comprehension and spoken German in discussions, short presentations and casual talks; based on material (films and texts) illustrating concerns of contemporary Germany.

Prerequisite: German 22.209 ★ or 22.210 ★, 22.213; or permission of the School.

Seminar three hours a week.

German 22.302 ★

Advanced Written German

The development of arguments and their effective presentation in texts expository and analytical, descriptive and narrative.

Prerequisite: German 22.210 ★, or 22.211 ★ or 22.212 ★, 22.213; or permission of the School.

Seminar three hours a week.

German 22.303 ★

Contrastive Semantics

Systematic analysis of German-English contrastive semantics: collocations (e.g. verb-noun, adjective-noun, adverb-adjective), emphatic particles, cognates and false cognates, word-field domains, cultural-specific metaphorizing and cognition, phraseology (idioms and similes), register.

Prerequisite: German 22.211 ★ or 22.213; or permission of the School.

Seminar three hours a week.

German 22.311 ★

Linguistic Text Analysis

Theory (structure, function and examples of written and spoken texts) and praxis of text analysis (representing fiction and non-fiction in modern German), production of written and spoken texts of various nonfictional types (Gebrauchstexte).

Prerequisite: German 22.211 ★ or 22.212 ★, or 22.213; or permission of the School.

Seminar three hours a week.

German 22.312

Twentieth-Century German as a Literary Language

Narrative style from the viewpoint of discourse analysis with particular emphasis on gender aesthetics. Texts by authors such as Thomas Mann, Franz Kafka, Günter Grass, Ilse Aichinger, Christa Reinig, Christa Wolf.

Prerequisite: German 22.210 ★ or 22.211 ★ or 22.212 ★, 22.213; or permission of the School.

Seminar three hours a week.

German 22.348 ★

Special Topic in a Genre in German Literature

This course discusses in different years the development of one of the literary genres (poetry, drama, prose) within a specific time-frame.

Prerequisite: German 22.240 or permission of the School.

Seminar three hours a week.

German 22.350

German Literature of the Eighteenth Century

The literature of the Enlightenment, Storm and Stress, and Early Classicism, with special emphasis on the works of Lessing, Goethe and Schiller.

Prerequisite: German 22.240 or permission of the School.

Seminar three hours a week.

German 22.352 ★

Special Topic in Nineteenth-Century German Literature

This course discusses, for example, an author, a genre, a theme.

Prerequisite: German 22.240 or permission of the School.

Seminar three hours a week.

German 22.380

German Literature in the Twentieth Century

Representative texts from drama, poetry, and prose fiction in the period from Hauptmann to Grass.

Prerequisite: German 22.240 or permission of the School.

Seminar three hours a week.

German 22.402 ★

Translation

Practical exercises in translation and consideration of some theoretical approaches.

Prerequisite: German 22.302 ★ or 22.311 ★; or permission of the School.

Seminar three hours a week.

German 22.403 ★

German Syntax

A systematic investigation of the principles of syntax in modern written German. Also offered at the graduate level, with additional or different requirements, as German 22.584, for which additional credit is precluded.

Prerequisite: German 22.302 ★ or 22.311 ★ or 22.402 ★; or permission of the School.

Lectures two hours a week and seminar one hour a week.

German 22.405

Formal German Speech (Die deutsche Rede)

A study of rhetoric as the art of persuasion and as instrument of power in political propaganda and mass communication in Germany from the Pre-World War I period, in the Third Reich, during the Cold War and after the Wende ("reunification"). Practice of forensic skills.

Precludes additional credit for German 22.401 ★.

Prerequisite: German 22.301 ★ or 22.302 ★, or 22.312; or permission of the School.

Lecture one hour and seminar two hours a week.

German 22.412

History of the German Language

Significant stages in the development of German: the evolution of its phonetic and grammatical structure, its vocabulary and stylistic norms. The social role of language of the twentieth century: language as a means of manipulation, divided German; socio-linguistic facets of contemporary literary language. Also offered at the graduate level, with additional or different requirements, as German 22.581, for which additional credit is precluded.

Prerequisite: One of German 22.211 ★ or 22.312 or 22.430; or permission of the School.

Lectures two hours a week and seminar one hour a week.

German 22.430

Medieval Language and Literature

Introduction to Medieval German; Medieval narrative style in heroic epic poetry (Nibelungenlied) and early vernacular love poetry (Minnesang). Also offered at the graduate level, with additional or different requirements, as German 22.563, for which additional credit is precluded.

Prerequisite: German 22.240 or permission of the School.

Seminar three hours a week.

German 22.440 ★

Early Modern German Literature

Selected readings from the Reformation and the Baroque.

Precludes additional credit for German 22.441 ★ and 22.442 ★.

Prerequisites: German 22.240 and 1.0 credit (or equivalent) in German at the 300-level; or permission of the School.

Seminar three hours a week.

German 22.454 ★

Seminar on a Topic from the Eighteenth Century

A detailed study of a movement, an author, a genre, etc.

Prerequisite: German 22.350 or permission of the School.

Seminar three hours a week.

German 22.469 ★

Selected Authors of the Nineteenth Century

A detailed study of works by specific authors such as Fontane or Keller or Kleist.

Prerequisite: German 22.240 or permission of the School.

Seminar three hours a week.

German 22.470

Seminar on a Literary or Linguistic Topic

Topic for 1999-2000: The development of the discourse on Nationalism in nineteenth and twentieth century Germany. Also offered at the graduate level with additional or different requirements, as German 22.586 for which additional credit is precluded.

Prerequisite: German 22.350 or 22.380; or permission of the School.

Seminar three hours a week.

German 22.471 ★

Seminar on a Selected Topic

Prerequisite: German 22.240 or permission of the School.

Seminar three hours a week.

German 22.472 ★

Literary Semiotics

Analysis of literary texts to discover the sign-systems through which literature communicates meaning. In different years the principal object of study will be the semiotics of either poetry or narrative prose or drama.

Prerequisite: German 22.240 or permission of the School.

Seminar three hours a week.

German 22.483 ★

Language and Society in Twentieth-Century Germany

The course concentrates on one of the following: language as a means of manipulation; divided German; socio-linguistic aspects of contemporary literary language.

Prerequisite: German 22.301 ★ or 22.302 ★, or 22.312; or permission of the School.

Seminar three hours a week.

German 22.490 ★

Tutorial on a Selected Topic

A topic in German literature (an author or group of authors, a genre, a theme or period) or in the linguistics of German.

Prerequisite: Permission of the School.

Seminar three hours a week.

German 22.491

Tutorial

A topic in German literature (an author or group of authors, a genre, a theme or period) or in the linguistics of German.

Prerequisite: Permission of the School.

Seminar three hours a week.

German 22.492 ★

Tutorial in Advanced Translation

Primarily for Honours students in their final year. Students complete a substantial translation project. Theoretical and institutional problems of translation are considered.

Prerequisites: German 22.311 ★ and 22.402 ★ or permission of the School.

Seminar three hours a week.

German 22.498

Honours Essay (2.0 credits)

Open to candidates for Honours German and Honours German Studies in their Fourth year. Minimum requirement for admission to the course: an average of A- in Third year in the two core disciplines for students in German Studies, or, for students in German, A- in German courses in Third year. Candidates for Honours German Studies are required to write an essay with an interdisciplinary topic. For all students the essay will be approximately 16,000 words.

Prerequisites: Permission of the School.

History

(Arts and Social Sciences)

400 Paterson Hall

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Acting Chair, Deborah Gorham

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Teaching Staff

Professors Emeriti

J.G. Bellamy, B.A. (Oxford), M.A. (Oxford and Nottingham), Ph.D. (Nottingham) • **David M.L. Farr**, B.A. (British Columbia), M.A. (Toronto), D.Phil. (Oxford) • **Naomi E.S. Griffiths**, B.A. (London), M.A. (New Brunswick), Ph.D. (London), Doc. d'Hist. (Université de Moncton), Doct. d'hist. (Ste-Anne, N.S.), Doc. Hum. Lett. (Mount St. Vincent), F.R.S.C. • **J.K. Johnson**, B.A. M.A. (Toronto) • **S.R. Mealing**, B.A. (Alberta), B.Litt., M.A. (Oxford) • **H. Blair Neatby**, B.A. (Saskatchewan), M.A. (Oxford), Ph.D. (Toronto), F.R.S.C. • **Michael J. Sydenham**, B.A., Ph.D. (London), F.R.Hist.S. • **S.F. Wise**, C.M., B.A., B.L.S. (Toronto), M.A. (Queen's), LL.D. (Guelph), F.R.S.C.

Professors

Kerry Abel, B.A. (Queen's), M.A. (Manitoba), Ph.D. (Queen's) • **J. Laurence Black**, B.A. (Mount Allison), M.A. (Boston), Ph.D. (McGill) • **B.S. Elliott**, B.A. (Carleton), M.A. (Leicester), Ph.D. (Carleton) • **R. Carter Elwood**, B.A. (Dartmouth), M.A., Ph.D. (Columbia) • **Deborah S. Gorham**, B.A. (McGill), M.A. (Wisconsin), Ph.D. (Ottawa) • **G. Norman Hillmer**, B.A., M.A. (Toronto), Ph.D. (Cambridge) • **Peter John King**, B.A., M.A. (Cambridge), A.M., Ph.D. (Illinois) • **Duncan L. McDowall**, B.A., M.A. (Queen's), Ph.D. (Carleton) • **A.B. McKillop**, B.A., M.A. (Manitoba), Ph.D. (Queen's) • **Paul C. Merkley**, B.A., M.A., Ph.D. (Toronto) • **D.A. Muise**, B.A. (St. Francis Xavier), M.A. (Carleton), Ph.D. (Western Ontario) • **Roderick Phillips**, B.A. (Trent), M.A. (Otago), D.Phil. (Oxford) • **Franz A.J. Szabo**, B.A. (Montréal), M.A., Ph.D. (Alberta)

Associate Professors

Marilyn J. Barber, B.A., M.A. (Queen's), Ph.D. (London) • **Y. Aleksandra Bennett**, B.A., M.A. (Windsor), Ph.D. (McMaster) • **D. Dean**, B.A., M.A. (Auckland), Ph.D. (Cambridge), F.R.Hist.S. • **E.P. Fitzgerald**, B.A. (Seton Hall), M.A., Ph.D. (Yale) • **R.B. Goheen**, B.A. (Toronto), M.A., Ph.D. (Yale) • **Grover F. Goodwin**, B.A. (Virginia), Ph.D. (Princeton) • **Jacob Kovalio**, B.A. (Tel-Aviv), M.A., Ph.D. (Pittsburgh) • **Walter Roy Laird**, B.A. (Concordia), M.A., Ph.D. (Toronto) • **Sonya Lipsett-Rivera**, B.A. (Ottawa), M.A., Ph.D. (Tulane) • **Dominique Marshall**, B.A., M.A., Ph.D. (Montréal) • **J.H. Taylor**, B.Sc. (Alberta), M.A. (British Columbia) • **Pamela J. Walker**, B.A. (Concordia), M.A. (York), Ph.D. (Rutgers)

Assistant Professor

Susan Whitney, B.A. (Princeton), M.A. (Brown), Ph.D. (Rutgers)

Adjunct Research Professors

N. Adamson • **B. Carman Bickerton** • **R.T. Clippingdale** • **V. Dickenson**, McCord Museum, Montreal • **W.A.B. Douglas** • **Toby Gelfand**, University of Ottawa • **S.J. Harris**, National Defence Headquarters • **M.W. Labarge** • **R.F. Sarty**, National Defence Headquarters

Adjunct Professors

F.J.K. Griezic • **H.A. MacDougall**

Programs of Study

Students intending to major in History, whether in the B.A. (Honours), B.A., or Graduate program, should first consult with the appropriate adviser. Students considering an Honours program should note particularly the compulsory requirements not included in the B.A. program. All majors in History should review their course of study annually with the appropriate adviser.

Graduation Regulations

In order to graduate, students must fulfill all University graduation regulations (see p. 48), all Faculty regulations including those relating to First-Year Seminars and Breadth requirements (see p. 63), all Major regulations and requirements as set out below.

Honours Program in History

Students in the B.A. (Honours) program are required to complete a minimum of 10.0 credits in History. They may satisfy the requirements in two different ways:

1. (a) 1.0 credit at the 100-level, to be taken in the First year (in exceptional circumstances a 200-level course may be taken in its place.)
- (b) 3.0 credits at the 200-level, to be taken in the Second year.
- (c) 3.0 credits at the 300-level, to include 24.388, to be taken in the Third year.
- (d) 3.0 credits at the 400-level, to be taken in the Fourth year. Students should endeavour to have at least one course at the 200- or 300-level in the area of each Fourth-year seminar. Not more than two seminars may be taken in any one of the following fields:

- (i) ancient, medieval and early modern Europe;
- (ii) modern Western Europe;
- (iii) Russia and Eastern Europe;
- (iv) Great Britain and the Commonwealth;
- (v) Canada;
- (vi) United States;
- (vii) European expansion and the non-Western world.

One of these seminar credits may, with departmental approval, be taken in a discipline other than History. Students choosing this option will be required to present only 9.0 History credits.

2. Students may elect to present a research essay (History 24.499) worth 2.0 credits as part of their Honours program. The program for these students is:

- (a) 1.0 credit at the 100-level, to be taken as part of the First year (in exceptional circumstances a 200-level course may be taken in its place).
- (b) 2.0 or 3.0 credits at the 200-level, to be taken in the Second year.
- (c) 2.0 or 3.0 credits at the 300-level, to include 24.388, depending on the number of 200-level credits taken. The decision to commit to a research essay should be made at the beginning of Third year.
- (d) History 24.499 (2.0 credits) and 2.0 400-level credits, to be taken in the Fourth year. Students should endeavour to have one course at the 200- or 300-level in the area of each fourth-year seminar. Not more than two seminars may be taken in any one of the following fields:

- (i) ancient, medieval and early modern Europe;
- (ii) modern Western Europe;
- (iii) Russian and Eastern Europe;
- (iv) Great Britain and the Commonwealth;
- (v) Canada;
- (vi) United States;
- (vii) European expansion and the non-Western world.

3. Courses offered at the 100-, 200-, and 300-levels generally fall into the following four fields:

- (a) ancient, medieval and early modern Europe;
- (b) modern Europe;
- (c) North America;
- (d) European expansion and the non-Western world.

Before beginning the Fourth year, all Honours students are required to take at least 1.0 credit at the 100-, 200-, or 300-level in three of the four fields. History 24.388 may not be used to satisfy this field requirement.

Combined Honours Programs

Students combining History with another subject are required to complete 6.0 credits in History.

- (a) 1.0 credit at the 100-level, to be taken in the First year (in exceptional circumstances a 200-level credit may be taken in its place).
- (b) 2.0 credits at the 200-level, to be taken in the Second year.
- (c) 2.0 credits at the 300-level, to include 24.388, to be taken in the Third year.
- (d) 1.0 credit at the 400-level to be taken in the Fourth year. Before beginning the Fourth year, Combined Honours students are required to take at least 1.0 credit at the 100-, 200-, or 300-level in three of the four fields listed under item 3 of the Honours Program in History.

B.A. Programs

Entrance and Continuation

Entry into History B.A. programs requires enrolment in a 100-level History course, or an equivalent approved by the Department. Continuation requires completion of such a course with a C- or better average, and maintenance of a C- or better average over all other History courses successfully completed. History graduation averages will be calculated on the 6.0 best History credits for the B.A.

B.A. Program in History

1. Students in the B.A. program in history are required to complete 7.0 credits in history:

- (a) 1.0 credit at the 100-level, to be taken in the First year (in exceptional circumstances a 200-level credit may be taken in its place).
- (b) 3.0 credits at the 200-level, to be taken in the Second year.
- (c) 3.0 credits at the 300-level, to be taken in the Third year.

Credits at the 400-level may be presented for graduation in a major program only with permission of the department.

2. Courses offered at the 100-, 200-, and 300-levels generally fall into the following four fields:

- (a) ancient, medieval, and early modern Europe;
- (b) modern Europe;
- (c) North America;
- (d) European expansion and the non-Western world.

B.A. students are required to take at least 1.0 credit at the 100-, 200-, or 300-level in three of the four fields. History 24.388 may not be used to satisfy this field requirement.

Minor in History

Students desiring a minor in history are required to complete 4.0 credits in history.

- (a) 1.0 credit at the 100-level;
- (b) 1.0 credit at the 200-level;
- (c) 1.0 credit at the 300-level;
- (d) 1.0 credit at either the 200- or 300-level.

"Mention: français"

Students in the B.A. (Honours) or B.A. program in History may qualify for the notation "Mention: français" by fulfilling the requirements outlined below. Those wishing to pursue this path should consult with the Department's "Mention: français" adviser. Approval of this adviser is required for all courses under the "Mention: français".

History courses presented in fulfillment of the "Mention: français" requirement can double as courses to satisfy History B.A. (Honours) or B.A. requirements.

Students enrolling in courses at the University of Ottawa will do so through the University of Ottawa Exchange Program. To enrol in courses in French at another university, students must obtain a Letter of Permission. (See articles 3.12 and 3.13, p. 66.)

B.A. (Honours) and Combined B.A. (Honours)

To graduate with the notation "Mention: français" students must include in their program the following:

- 1. 1.0 credit in French language chosen in consultation with the Department of French for the purpose of perfecting the student's French language skills.

2. 1.0 credit from the following list of courses taught in French at Carleton or the University of Ottawa and relating to the French experience in Canada: (Carleton) French 20.372 ★ and 20.373 ★; (University of Ottawa) Histoire HIS 2601, HIS 2701; Français FRA 2525, FRA 2526, FRA 2711, FRA 2714, FRA 2722, FRA 2727; Linguistique LIN 2502; Études Religieuses SRS 2530.

3. 1.0 credit in History at the 200- or 300-level taught in French at Carleton, at the University of Ottawa or at another university. At Carleton, History 24.390 and 24.391 ★ are available in French to meet this requirement.

4. Either History 24.498, or a 1.0 credit History seminar at the 400-level taught in French at the University of Ottawa. All written work must be submitted in French.

5. Combined Honours students must meet the "Mention: français" requirements of both Honours disciplines.

BA

To graduate with the notation "Mention: français" students must include in their program the following:

1. 1.0 credit in French language chosen in consultation with the Department of French for the purpose of perfecting the student's French language skills.

2. 1.0 credit from the following list of courses taught in French at Carleton or the University of Ottawa and concerned with the study of the heritage and culture of French Canada: (Carleton) French 20.372 ★ and 20.373 ★; (University of Ottawa) Histoire HIS 2601, HIS 2701; Français FRA 2525, FRA 2526, FRA 2711, FRA 2714, FRA 2722, FRA 2727; Linguistique LIN 2502; Études Religieuses SRS 2530.

3. 1.0 credit in History at the 200- or 300-level taught in French at Carleton, at the University of Ottawa or at another university. At Carleton, History 24.390 and 24.391 ★ are available in French to meet this requirement.

Cross-Listed Courses

The Department of History cross-lists several courses offered by other departments (e.g., several Classical Civilization courses in the Discipline of Classics). No more than 2.0 credits in cross-listed courses may be included in the 7.0 credits required for the B.A. program. No more than 3.0 credits in cross-listed courses may be included in a B.A. (Honours) or Combined B.A. (Honours) program.

Prerequisites

Unless otherwise stated, except for 24.388 the prerequisite for any 300-level course is:

1. A 200-level course, preferably in an appropriate field (for fields, see B.A. Program in History, paragraph 2); or

2. Third-year standing.

The prerequisite for 24.388 is Third-year standing.

The prerequisite for any 400-level course is permission of the Department.

Permission will normally be granted to students who have taken two 300-level History courses, with one course at either the 200- or 300-level in an appropriate field. Special students will be admitted to 400-level courses only under exceptional circumstances.

Requirement for Breadth, for students in B.A. or B.A.(Honours) degrees

Category for Breadth	Courses in this unit
The temporal dimension of human societies, analyzing times before the present era or societies other than our own	All History courses not listed in any other category
The artifacts of the imagination in literature and/or other forms, or that addresses the life of the imagination and culture.	
The understanding of social, technological and/or natural processes and the ways in which that understanding is obtained in science and social science.	(24.)221, 222
Matters of human values, ethics and social responsibilities	(24.)210, 254, 281, 310, 346 ★, 347 ★, 348, 354, 356 ★, 362 ★

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

First-Year Seminar in History 01.112

History of Western Civilization

Major events, ideas and movements that have shaped western civilization from the fall of Rome to the twentieth century. Emphasis on the development of writing, research and analytical skills. Limited enrolment.

Precludes additional credit for History 24.101.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Lectures two hours a week, seminar two hours a week.

First-Year Seminar in History 01.113

Introduction to Canadian History

Historical study of the political, economic and social development of Canada with emphasis on the twentieth century. The seminar emphasizes the development of writing, research, and analytical skills. Limited enrolment.

Precludes additional credit for History 24.130.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Lectures two hours a week, seminar two hours a week.

First-Year Seminar in History 01.145

Turning Points in Modern History

Introductory seminars emphasizing the development of writing, research, and analytical skills through the intensive examination of selected topics in modern history.

Precludes additional credit for History 24.100 and 24.109.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

History 24.101

History of Western Civilization

A survey of the major events, ideas and movements that have shaped western civilization from the fall of Rome to the twentieth century. (Field a or b)

Precludes additional credit for First-Year Seminar 01.112.

Prerequisite: Registration is restricted to First-year students.

Lectures two hours a week, discussion groups one hour a week.

History 24.102

Europe in the Twentieth Century

An introduction to some of the major ideological, political, diplomatic, military, social, cultural and economic developments that have shaped contemporary Europe. This course is designed primarily for students who do not plan to major in history. Registration is restricted to First-year students, except for those students who need the course to satisfy the degree requirements of their department, faculty, or school. (Field b)
Lectures three hours a week.

History 24.109

Turning Points in Modern History

Introductory seminars emphasizing the development of writing, research and analytical skills through the intensive examination of selected topics in modern history. (Field a, b or c)
Precludes additional credit for History 24.100 and First-Year Seminar 01.145.
Registration is restricted to First-year students.
Seminar three hours a week.

History 24.130

Introduction to Canadian History

A historical study of the political, economic and social development of Canada with emphasis on the twentieth century. (Field c)
Precludes additional credit for First-Year Seminar 01.113.
Prerequisite: Registration is restricted to First-year students, except for those students who need the course to satisfy the degree requirements of their department, faculty, or school.
Lectures two hours a week, discussion group one hour a week.

History 24.170

Europe and the Non-Western World

A study of European expansion overseas and of the range of local responses to Western pressures, with a view to explaining how this two-fold process shaped the historical development of Asia, Africa and Latin America. (Field d)
Registration is restricted to First-year students, except for those students who need the course to satisfy the degree requirements of their department, faculty, or school.
Lectures three hours a week.

History 24.205

England During the Middle Ages

A study concentrating on the political development of medieval England, A.D. 410-1485. (Field a)
Lectures three hours a week.

History 24.210

Introduction to the History of Ideas

A study of Western intellectual development which considers such movements as humanism, the Enlightenment, romanticism, Darwinism and contemporary ideologies. (Field a or b)
Lectures three hours a week.

History 24.221

History of Science

An introduction to the history of science from antiquity to the twentieth century. Readings include works by Plato, Aristotle, Grosseteste, Galileo, Newton, Darwin and Einstein. No special knowledge of modern science is assumed. (Field a or b)
Lectures three hours a week.

History 24.222

The Industrial Revolution

A study of the economic and technological changes that transformed Western society during the nineteenth century. (Field b)
Lectures three hours a week.

History 24.223

A History of Early Modern Europe, 1500-1789

The social, economic, cultural and political development of Eu-

rope (including Scandinavian, Eastern and Mediterranean as well as Western and Central Europe) from the era of the Reformation to the outbreak of the French Revolution. Special attention is paid to social themes. (Field a)
Lectures three hours a week.

History 24.224

The Revolutionary Tradition in Europe, 1789-1900

Beginning with the French Revolution of 1789, the course includes such significant movements as romanticism, nationalism, the rise and implications of industrialism, and the development of socialist theory culminating in Marxism. (Field b)
Lectures three hours a week.

History 24.233

Canadian Political History

A historical survey of the Canadian political tradition from the late eighteenth century to the present. Politicians, parties, ideas, social context and dissent are examined. Second-year standing recommended. (Field c)
Lectures three hours a week.

History 24.234

Canadian Social History

A historical survey of the structure and values of Canadian societies from the eighteenth to the twentieth centuries. Second-year standing recommended. (Field c)
Lectures three hours a week.

History 24.235

Canadian Economic History

A historical survey of persistence and change in the Canadian economy from the eighteenth to the twentieth centuries. (Field c) (Also listed as Economics 43.235.)
Prerequisite: Economics 43.100 or permission of the Department of History.
Lectures three hours a week.

History 24.236

The Spanish and English Colonies in North America

A comparative study of the development of the English North American colonies and New Spain (Mexico), with emphasis on settlement, social patterns and institutions, the frontier, native peoples and the emergence of a colonial sense of identity. (Field c or d)
Lectures three hours a week.

History 24.237

The History of Latin America

A survey of the political, economic, and social development of Latin America from the colonial era to the twentieth century. (Field d)
Lectures three hours a week.

History 24.240

History of the United States of America

A survey of United States politics and society since the American Revolution. (Field c)
Lectures three hours a week.

History 24.250

Modern England, 1460-1918

A survey of significant political and social developments in England from the mid-fifteenth to the early twentieth century. (Field a or b)
Lectures three hours a week.

History 24.254

Introduction to the History of Women

A survey of themes in the history of women with emphasis on their European experience, from the early modern period to the present. (Field a or b)
Lectures three hours a week.

History 24.256

Comparative History of England and France

A comparison of political and social developments in two major Western European countries, from the seventeenth to the nineteenth century. (Field a or b)

Lectures three hours a week.

History 24.259

A History of Germany

A history of the German-speaking peoples from the rise of the Holy Roman Empire to the present. (Field a or b)

Lectures three hours a week.

History 24.260

History of Russia and the U.S.S.R.

A survey of Russian history from rise of Kievan Rus to the collapse of the Soviet Union in 1991, with emphasis on the period from the reign of Peter the Great to the revolutions of 1917. (Field a or b)

Lectures three hours a week.

History 24.273

International Economic History, 1815-1940

A study of international economic relations from the Industrial Revolution to the Great Depression, with emphasis on two central themes: the role of foreign trade, finance and investment in shaping patterns of national development; the interplay of international economic relations and international politics. (Field b or d)

Precludes additional credit for History 24.272.

Lectures three hours a week.

History 24.275

History of Africa

An introduction to the history of Africa. The first half is devoted to the period prior to European colonization with emphasis on West African states and empires; the second half deals with resistance to colonization, European colonial rule, independence and liberation movements. (Field d)

Lectures three hours a week.

History 24.278

The Middle East: 1798 to the Present

The history of the development of the civilization and culture of the Middle East from 1798 to the present with special emphasis on the mutual discovery of East and West, the search for identity, the impact of colonialism and international rivalry, and social, religious and cultural change within a continuing tradition. (Field d) (Also listed as Religion 34.278.)

Lectures three hours a week.

History 24.280

The Diplomatic History of Europe, 1815-1914

A survey of diplomatic history from the Congress of Vienna to the outbreak of the First World War. (Field b)

Lectures three hours a week.

History 24.281

War and Peace in the Modern World

A comparative survey of the social consequences of war for the major Western European states and Russia from Napoleon to Hitler, and the efforts of international organizations and governments to seek alternative ways to resolve international conflict. (Field b)

Lectures three hours a week.

History 24.285

History of China

A survey of Chinese political and intellectual history from the Xia Dynasty to the 1911 Revolution. Emphasis is placed on the impact of the West on China from the sixteenth to the twentieth century. (Field d)

Lectures three hours a week.

History 24.286

History of Japan

A survey of Japanese history from the legendary beginning of the country in 600 B.C. to the end of World War Two. (Field d)

Lectures three hours a week.

History 24.290

History of Ancient Greece

The history of classical Greece to the conquest of Asia by Alexander with special attention to the development of her characteristic institutions. (Field a) (Also listed as Classical Civilization 13.290.)

Prerequisite: Second-year standing or permission of the Department.

Lectures two hours a week.

History 24.291

History of Ancient Rome

The history of ancient Rome, her organization and expansion especially during the late Republic and early Empire. (Field a) (Also listed as Classical Civilization 13.291.)

Prerequisite: Second-year standing or permission of the Department.

Lectures two hours a week.

History 24.299

Special Subject in History

A lecture course on a special topic, theme, or period. Topic for 1999-2000: The Millennium in History: Millenarianism and its social and political manifestations from antiquity to the twentieth century. (Field a, b or c)

Lecture three hours a week.

History 24.302

The Later Roman Empire

A study of major developments-administrative, ecclesiastical, cultural and societal-of the later Roman Empire. (Field a) (Also listed as Classical Civilization 13.302.)

Prerequisite: A 200-level History course or Third-year standing.

Lectures three hours a week.

History 24.303

History of the Byzantine Empire, 527-1453 A.D.

The history of the Byzantine empire from Justinian the Great in the sixth century A.D. to the fall of Constantinople in 1453 A.D. Special attention is given to the cultural, religious and institutional development of Byzantium and their impact on the Slavic, Western European and Islamic countries. (Field a) (Also listed as Classical Civilization 13.303.)

Prerequisite: A 200-level History course or Third-year standing. Lectures two hours a week.

History 24.306 ★

Early Medieval Thought

A general examination of medieval European intellectual life from the fifth to the twelfth century, with special reference to its setting in the monastery and the cathedral school. (Field a)

Precludes additional credit for History 24.305. Prerequisite: A 200-level History course or Third-year standing.

Lectures three hours a week.

History 24.307 ★

Later Medieval Thought

A general examination of medieval European intellectual life in the thirteenth and fourteenth centuries, with special reference to its setting in the university. (Field a)

Precludes additional credit for History 24.305. Prerequisite: A 200-level History course or Third-year standing.

Lectures three hours a week.

History 24.309 ★

Studies in Greek History and Institutions

A study of one of the major periods of ancient Greek history. Topic for 1999-2000: Greek Democracy (Field a) (Also listed as

Classical Civilization 13.321 ★.)

Prerequisite: Classical Civilization 13.290/History 24.290.

Lectures two hours a week.

History 24.310

Modern Intellectual History

An intensive study of selected aspects of American, Canadian and European intellectual history in the nineteenth and twentieth centuries, with emphasis on twentieth-century social thought. (Field b or c)

Prerequisite: A 200-level History course or Third-year standing.

Lectures three hours a week.

History 24.311 ★

Studies in Roman History and Institutions

A study of one of the major periods or themes of the history of ancient Rome. Topic for 199-2000: Julio-Claudian Dynasty. (Field a) (Also listed as Classical Civilization 13.322 ★.)

Prerequisite: Classical Civilization 13.291/History 24.291.

Lectures two hours a week.

History 24.315 ★

Renaissance Europe

The political and cultural history of Europe in the fourteenth, fifteenth and sixteenth centuries, with emphasis on the Italian Renaissance and its diffusion into England and France. (Field a)

Precludes additional credit for History 24.215.

Prerequisite: A 200-level History course or Third-year standing.

Lectures three hours a week.

History 24.316 ★

The Social History of Sexuality

Sexuality in Western society, Middle Ages to the present. Themes include attitudes and behaviour; regulation of sexuality; gender; heterosexuality and homosexuality; prostitution; pornography; the politics of sex: stresses continuities and changes and the understanding of sexuality in contexts of place, class, gender, and culture. (Fields a or b)

Prerequisite: A 200-level History course or Third-year standing.

Lectures three hours a week.

History 24.317

The European Family

Comparative study of the family in early modern and modern Europe. Themes include family and household forms; family economy and government; demography; law; marriage formation, stability and breakdown; gender and family relationships; sexuality. (Field a or b)

Prerequisite: A 200-level History course or Third-year standing.

Lectures three hours a week.

History 24.318

France Under the Old Regime and Revolution

Study of the main social, economic and political developments in eighteenth-century France, with emphasis on the origins and course of the Revolution up to 1799. (Field b)

Precludes additional credit for History 24.316.

Prerequisite: A 200-level History course or Third-year standing.

Lectures three hours a week.

History 24.319 ★

The Social History of Alcohol

Alcohol in Western society from Ancient times to the present. Production, trade, and consumption of alcohol; religious and social significance; class, gender, and health; drinking cultures; policies toward drunkenness, and alcoholism. Specific topics include comparative trends, temperance movements, and prohibition. (Fields a or b)

Prerequisite: A 200-level History course or Third-year standing.

Lectures three hours a week.

History 24.320

Freedom and Power in the Western World, 1840-1880

An intensive study of the political and social crises that dominated

the Western world in the mid-nineteenth century, with a view to explaining how their outcomes shaped the relationship between individual liberty, social identity, and national power in the major states. (Field b)

Prerequisite: A 200-level History course or Third-year standing.

Lectures three hours a week.

History 24.321

The Enlightenment

An intellectual and cultural history of eighteenth-century Europe, with particular attention to Scotland, France and Italy. Representative themes include the shaping of historical knowledge, gender and sensibility; manners and private life; the literature of travel and ethnography, science and medicine. (Field b)

Prerequisite: A 200-level History course or Third-year standing.

Lectures three hours a week.

History 24.322 ★

Capital Cities in the Modern World

An examination of capital cities from the early modern period to the present. Ottawa and the provincial capitals of Canada will be a particular focus. (Field c)

Prerequisite: A 200-level History course or Third-year standing.

Lectures three hours a week.

History 24.324

Colonial Frontier Societies

An examination of four or five frontier societies in the eighteenth and nineteenth centuries, most of them Canadian, in which the presence of either European or North American metropolitan influences were critical to the character of development. (Field c or d)

Prerequisite: A 200-level History course or Third-year standing.

Lectures three hours a week.

History 24.325 ★

History of Business in Canada: 1850-1980

The place of business in Canadian society, economics and politics. The internal dynamics of Canadian business (organization, strategy, the rise of the manager), and its external implications (competition, foreign investment, business-government relations). (Field c)

Precludes additional credit for Business 42.468 ★.

Prerequisite: A 200-level History course or Third-year standing.

Lectures three hours a week.

History 24.327 ★

Introduction to Local History

An examination of the methods and approaches that characterize recent British, French and North American writing on local history. (Field c)

Prerequisite: A 200-level History course or Third-year standing.

Lectures three hours a week.

History 24.328 ★

Eastern Ontario Communities

The local history of Eastern Ontario, with particular reference to the settlement and development of the Ottawa Valley in the nineteenth century. (Field c)

Prerequisite: A 200-level History course or Third-year standing.

Lectures three hours a week.

History 24.329 ★

Canadian Urban History

Introduction to urban growth and development in Canada. The historical basis of the urban pattern and its influence in Canada and the internal structure and institutions of Canadian cities. Ottawa is used as a case study. (Field c)

Prerequisite: A 200-level History course or Third-year standing.

Lectures three hours a week.

History 24.330 ★

The History of Upper Canada to 1867

An introduction to the economic, social and political development of Upper Canada to the time of Confederation. (Field c)

Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.331 ★

Quebec Since the 1860s

A social, economic, cultural and intellectual history of Quebec with emphasis on the development of Quebec nationalism. (Field c)
Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.332 ★

The Atlantic Provinces

Selected periods in the history of the four Atlantic Provinces. Themes covered include: settlement and population; economic trends; religious and cultural development; social and political evaluation. (Field c)
Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.333 ★

The History of Ontario, 1867-1967

An introduction to the economic, social and political development of the Province of Ontario. (Field c)
Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.334 ★

Canada-United States Relations

An examination of diplomatic, economic, cultural and military relations, with particular attention to the twentieth century. (Field c)
Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.335

History of Canadian Labour

A social, economic, political and cultural history of workers responses to the evolving Canadian capitalist system, with emphasis on the twentieth century. (Field c)
Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.336 ★

Canadian External Relations

The development of Canadian attitudes and policies toward external affairs, with emphasis on the twentieth century. (Field c)
Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.337 ★

Development and Underdevelopment in Atlantic Canada, 1660-1960

Case-study analyses of the contrasts of development in different regions of all four Atlantic provinces from early colonial times to the modern period or permission of the Department. (Field c)
Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.339 ★

History of the Canadian West

The economic, social and political evolution of Western Canada from European penetration to the present. (Field c)
Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.341 ★

The American Revolution

A study of the causes and course of the movement leading to the independence of the United States. Particular emphasis is given to ideology, society, local issues and revolutionary organization. (Field c)
Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.342 ★

Expansion, Sectionalism and Reform: The United States, 1819 to 1850

An examination of major developments in the United States from the Panic of 1819 to the Compromise of 1850, stressing the major social and political issues arising from territorial expansion, immigration and the reform impulse. (Field c)
Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.344

The United States Since Pearl Harbour

Some principal themes in the history of the United States since 1941. (Field c)
Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.346 ★

The History of African-American Women from Slavery to the Civil Rights Movement

An examination of aspects of the social, cultural, and political history of African-American women since the eighteenth century. (Field c)
Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.347 ★

Blacks in the United States

A study of blacks in the United States, which concentrates on their experience under slavery and the recurring themes of integration and separatism after emancipation. (Field c)
Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.348

American Intellectual History

An examination of American thought from the colonial period to the twentieth century, with emphasis on political, social and religious ideas and their relation to American society and institutions. (Field c)
Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.349

History of United States Foreign Policy Since 1865

A study of the United States as a world power in its international and domestic context. (Field c)
Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.350 ★

Canadian Immigration and Settlement: 1760-1875

A study of immigration to and within British North America and of the adaptation of immigrants to colonial life between the Seven Years War and the early years of Confederation. (Field c).
Precludes additional credit for History 24.338 ★.
Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.351 ★

Selected Topics in Canadian History

A lecture course on a thematic area in Canadian history. For Section A, the topic for 1999-2000 is War and Society in Canada. For Section B, the topic for 1999-2000 is Canadian War Art. (Field c)
Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.353

Aboriginal Peoples of Canada

The history of the aboriginal peoples of Canada, including cultural, political, and economic themes. (Field c).
Precludes additional credit for History 24.352 ★ and 24.353 ★.

Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.354

Women and North American Society

An examination of the changes that have taken place in the position of women in North America and the relationship of these changes to other social, economic and intellectual developments. (Field c)

Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.356 ★

Welfare and Poverty in Canadian History

Analysis of the development of the Canadian welfare state. Chronological examination of welfare arrangements in Canada since the beginning of the nineteenth century; comparisons with selected western countries; discussions of the role of different social groups in policy formation. (Field c)

Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.357 ★

Canadian Immigration and Settlement Since 1875

A study of immigration to Canada and of the adaptation of immigrants to their new environment from 1875. (Field c)

Precludes additional credit for History 24.338 ★.

Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.358

Society and Politics in England circa 1500-1914

An enquiry into the relationship between society and politics in England. (Field a or b)

Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.359 ★

A History of the Habsburg Monarchy, 1526-1918

The rise and fall of the multi-national empire of the Habsburgs from the unification of Austria, Bohemia, and Hungary to the collapse of the empire in the First World War. (Field a or b)

Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.360

History of the U.S.S.R.

A history of the politics, diplomacy, culture and society of Soviet Russia from 1917 to the end of the U.S.S.R. in 1991. (Field b)

Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.362 ★

Image and Actuality in the History of the Modern Canadian Family

The transformations of family life in Canada since 1800, its varieties, its continuities, its relationship with political and economic institutions, and the changing status of its members. The construction of ideas about families will be discussed to underline the complex dynamic between images and practices. (Field c)

Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.363 ★

Themes in Modern European Women's History

An examination of themes in the social, cultural, and intellectual history of modern European women. (Field b)

Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.364 ★

Selected Topics in European History

A lecture course on a thematic area in European history. Topic for

1999-2000 is Youth, Politics and Society in Modern Europe (Field b)

Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.365 ★

The Soviet Union in International Affairs

Study of Soviet diplomatic activity and foreign policy principles from the founding of Comintern in 1919 to the end of the U.S.S.R. in 1991. (Field b)

Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.366 ★

Modern East Central Europe

A study of the political and diplomatic history of East Central Europe since 1848 with emphasis on Poland and Czechoslovakia. (Field b)

Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.371 ★

Selected Topics in International Economic History

A lecture course on a thematic area of international economic relations. (Field b)

Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.372

History of the International Oil Industry

Origins and development of the world's largest international business from the 1850's to the 1990's. Growth of transnational oil companies, inter-firm rivalry and cooperation, the opening of frontier producing regions, the rise of OPEC, oil as a factor in international conflict and war. (Field c or d)

Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.374

History of Mexico

A survey of the historical forces which forged national identity from the Mexica to NAFTA. This course will examine political, social and economic structures to explain the particular sense of mexicanidad which characterizes the modern nation of Mexico. (Field c or d)

Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.375 ★

Latin American Women to 1825

An introduction to the history of women and the family in Latin America from pre-hispanic cultures to the wars of independence. This course will examine the lives of indigenous, Spanish, and African women within the context of colonialism. (Field d)

Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.376 ★

Revolutions in Latin America

The context of revolutions and attempted revolutions as well as the question of resistance will be examined in a chronological framework. While exploring the revolutionary movements of the colonial and nineteenth-century periods, the course will focus on the twentieth century experience. (Field d)

Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.377 ★

Latin American Women from 1825

An examination of Latin American women and the family in the national period with an emphasis on the growing role of women in politics and the impact of education and feminism in the region. (Field d)

Precludes additional credit for History 24.375 ★ (if taken before 1999-2000).

Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.378 ★

Reformation Europe

A history of the Protestant and Catholic Reformations of the sixteenth century, with special emphasis on the theological disputes of the protagonists and the impact of these disputes on the social, political and cultural developments of the era. (Field a) (Also listed as Religion 34.378 ★).

Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.380

International History, 1914-1956

A survey of international history in the First World War; peace-making 1919-1923; inter-war diplomacy and the origins of the Second World War; the relations of the powers in the Second World War; and post-war relations and the Cold War. (Field b)

Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.384 ★

Selected Topics in Non-Western History

A lecture course on a thematic area in non-Western history. (Field d)

Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.385 ★

Twentieth-Century China

A political history of China from the 1911 Revolution to the present. Emphasis is placed on the development of Chinese communism and the People's Republic since 1949. (Field d)

Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.386 ★

Japan Since 1945

A political, intellectual and economic history of Japan in the twentieth century, concentrating on the period since the end of the Pacific War. (Field d)

Prerequisite: A 200-level History course or Third-year standing.
Lectures three hours a week.

History 24.387 ★

Practicum in History

An historical research project in a museum or public institution in the Ottawa area conducted under the supervision of the external institution and the History Department. Work includes reading, reports, and meetings. Students should be prepared to devote one day a week to the project.

Prerequisite: Major or Honours history student with Third- or Fourth-year standing and a G.P.A. of 9.0 or better in history courses, or permission of the Department.

History 24.388

Historical Theory and Method

An examination of questions concerning the nature and value of historical enquiry and the meaning of the course of history.

Prerequisite: Third-year standing.
Lectures two hours a week, discussion groups one hour a week.

History 24.390

Études Dirigées

Un programme de lectures choisies et de travaux écrits dans le domaine de spécialisation d'un membre du département. Consultez le conseiller de Mention: français pour les sujets offerts.

For students of "Mention: français" only.

Permission of the "Mention: français" adviser required.

Precludes additional credit for History 24.391 ★.
Tutorials to be announced.

History 24.391 ★

Études Dirigées

Voir History 24.390 pour description.

Permission of the "Mention: français" adviser required.

Precludes additional credit for History 24.390.

Tutorials to be announced.

History 24.402

Beginnings of Early Medieval Europe and the Near East

A seminar on the transformation of the later Roman world into the polities of early Medieval Europe and the Near East (Field i) (Also listed as Classical Civilization 13.402.) Also offered at the graduate level, with additional or different requirements, as History 24.502, for which additional credit is precluded.

Prerequisite: Permission of the Department.

Seminar three hours a week.

History 24.405

Selected Problems in Medieval History

A seminar on crime, criminal law, and society in medieval England. (Field i) Also offered at the graduate level, with additional or different requirements, as History 24.505, for which additional credit is precluded.

Prerequisite: Permission of the Department.

Seminar three hours a week.

History 24.406

Medieval Intellectual History

An examination of selected aspects of medieval intellectual history. (Field i) Also offered at the graduate level, with additional or different requirements, as History 24.506, for which additional credit is precluded.

Prerequisite: Permission of the Department.

Seminar three hours a week.

History 24.407

Galileo and His Age

Examination of the scientific and polemical works of the Italian physicist and astronomer Galileo Galilei (1564-1642). Special attention to the role of patronage, the Jesuits, biblical interpretation, and the circumstances that led to his trial and condemnation. (Field i) Also offered at the graduate level, with additional or different requirements, as History 24.507, for which additional credit is precluded.

Prerequisite: Permission of the Department.

Seminar three hours a week.

History 24.417

Selected Topics in the History of Eighteenth- and Nineteenth-Century France

A seminar on selected problems and issues related to the history and historiography of France in the early modern and modern period. (Field ii)

Prerequisite: Permission of the Department.

Seminar three hours a week.

History 24.421

Science and Technology in the Canadian Experience

An examination of the role and relationship of science and technology, including their social and engineering applications, in the Canadian historical experience. (Field v) Also offered at the graduate level, with additional or different requirements, as History 24.536, for which additional credit is precluded.

Prerequisite: Permission of the Department.

Seminar three hours a week.

History 24.422

The Maritimes in Transition, 1870s to 1920s

A seminar on social and economic themes. (Field v) Also offered at

the graduate level, with additional or different requirements, as History 24.537, for which additional credit is precluded.
Prerequisite: Permission of the Department.
Seminar three hours a week.

History 24.424

Canadian Immigration and Ethnic History

An examination of immigration and ethnic history in a selected period between the eighteenth and the twentieth centuries. (Field v) Also offered at the graduate level, with additional or different requirements, as History 24.530, for which additional credit is precluded.

Prerequisite: Permission of the Department.

Seminar three hours a week.

History 24.426

Perspectives on State Formation in Canada

Exploration of selected problems of political history: the construction of official statistics, the language of governments, the invention of nationalisms, the making of political cultures, the autonomy of the state, the practices of bureaucrats and the political role of women. (Field v) Also offered at the graduate level, with additional or different requirements, as History 24.526, for which additional credit is precluded.

Prerequisite: Permission of the Department.

Seminar three hours a week.

History 24.429

Selected Topics in Greek and Roman History

Intended for Honours students in Classics or History in their Third- or Fourth-year. (Field i) (Also listed as Classical Civilization 13.429.) Prerequisites: Classical Civilization 13.290 (24.290) or 13.291 (24.291) or 13.321 ★ (24.309 ★) or 13.322 ★ (24.311 ★) and permission of the Department.

Seminar two hours a week.

History 24.430

Colonial Society in British North America

A seminar involving a comparative examination of two or more of the British North American colonies. (Field v)

Prerequisite: Permission of the Department.

Seminar three hours a week.

History 24.431

Canada from Confederation to the Great War

A seminar examining political and social transformations of the nation-making phase of our history. (Field v)

Prerequisite: Permission of the Department.

Seminar three hours a week.

History 24.433

Selected Problems in Canadian Business History, 1850-1980

Combining extensive reading of the secondary literature with research in primary collections in the Ottawa area, this seminar focuses on central themes of business development in Canada since 1850. (Field v)

Prerequisite: Permission of the Department.

Seminar three hours a week.

History 24.434

History of Northern Canada

History of the Canadian north, including both provincial and territorial norths. Topics include native peoples, the fur trade, resource frontier development and Canadian concepts of "north". (Field v) Also offered at the graduate level, with additional or different requirements, as History 24.529, for which additional credit is precluded.

Prerequisite: Permission of the Department.

Seminar three hours a week.

History 24.437

Canada from War to War

A seminar on the contours of Canadian development through the crises of war, reconstruction and depression. (Field v)

Prerequisite: Permission of the Department.

Seminar three hours a week.

History 24.438

Studies in the History of Popular Culture

Selected studies in the social history of culture in the age of mass society, including the popular arts, and the "culture of consumption". (Field v)

Prerequisite: Permission of the Department.

Seminar three hours a week.

History 24.439

Modern Canada Since 1939

Selected aspects of Canadian industrialization, urbanization, unionization, federalism, regionalism, feminism, nationalist ideologies, popular culture, and class and intellectual development. (Field v)

Prerequisite: Permission of the Department.

Seminar three hours a week.

History 24.440

A Selected Period in United States History

A seminar that considers the relationship among the political, social, economic and intellectual aspects of one of the following periods: (a) The American Revolution; (b) the early modern period, 1783-1816; (c) the Jacksonian era, 1819-1850; (d) the progressive era, 1896-1912; (e) the interwar years, 1920-1941; (f) since 1941. For 1999-2000, the period will be (f). (Field vi)

Prerequisite: Permission of the Department.

Seminar three hours a week.

History 24.443

The Religious Factor in the History of the United States

A study of the role played by religious faith in the history of the United States, with special emphasis on political activities, the public philosophy, public policy and the American concept of national destiny. (Field vi)

Prerequisite: Permission of the Department.

Seminar three hours a week.

History 24.452

Gender and the Culture of Protestantism

Protestant women's religious expression and experience from the seventeenth through the nineteenth centuries in the British and transatlantic contexts. How gender relations, class, and race shaped women's piety and religious sensibility. (Field ii, iv, vi)

Prerequisite: Permission of the Department.

Seminar three hours a week.

History 24.454

Selected Problems in the History of Women and the Family: the Pre-Industrial Atlantic World

Selected problems relating to the pattern of women's lives from the mid-sixteenth to the early eighteenth century. Major focus on Britain and France, Quebec and Acadia; some attention to the experiences of Amerindian women, especially Micmac. (Field iv, v)

Prerequisite: Permission of the Department.

Seminar three hours a week.

History 24.455

Selected Problems in Modern German History

A seminar on selected problems relating to the political, social, economic, cultural, and intellectual developments of German-speaking central Europe in the modern era with emphasis on the Third Reich. (Field ii)

Prerequisite: Permission of the Department.

Seminar three hours a week.

History 24.456

Selected Themes in the History of Central Europe

Selected problems relating to the history of the Habsburg Monarchy and its successor states. Focus on the cultural identity of central Europe, especially the problems of cultural integration in a multicultural society. (Field iii)

Prerequisite: Permission of the Department.

Seminar three hours a week.

History 24.457

Selected Problems in Tudor History

A seminar designed to examine recent historical approaches to the problems of power and community in Tudor England in the light of some current social-philosophical theories of politics and society. (Field i, iv) Also offered at the graduate level, with additional or different requirements, as History 24.557, for which additional credit is precluded.

Prerequisite: Permission of the Department.

Seminar three hours a week.

History 24.458

Selected Problems in Nineteenth- and Twentieth-Century British Social History

A seminar primarily concerned with themes in social history. (Field ii, iv)

Prerequisite: Permission of the Department.

Seminar three hours a week.

History 24.459

Selected Topics in the History of Women and Gender in the Nineteenth and Twentieth Centuries

A seminar on selected themes relating to the history of women and gender since the eighteenth century. The themes will be developed within a national or transnational context that will be specified each year. (Field ii, iv, v)

Prerequisite: Permission of the Department.

Seminar three hours a week.

History 24.460

Selected Problems in Russian History

A seminar on selected problems relating to late Imperial Russia. (Field iii)

Prerequisite: Permission of the Department.

Seminar three hours a week.

History 24.461

Selected Problems in Soviet History

A seminar on selected problems relating to the establishment and subsequent course of the Soviet Union. (Field iii)

Prerequisite: Permission of the Department.

Seminar three hours a week.

History 24.471

Selected Problems in International Economic History

A seminar concerned with the political economy of international economic relations, their influence on patterns of national development, and their links with international politics. (Field vii)

Prerequisite: Permission of the Department.

Seminar three hours a week.

History 24.476

Selected Problems in Latin American History

A seminar on the institutions, ideologies, and social structures which influenced the creation of national identities in Latin America. (Field vii)

Prerequisite: Permission of the Department.

Seminar three hours a week.

History 24.480

Selected Problems in the Diplomacy of the Great Powers, 1906-1945

A seminar on selected problems in diplomatic history from the origins of the First World War. (Field ii)

Prerequisite: Permission of the Department.

Seminar three hours a week.

History 24.485

Selected Problems in East-Asian History

A seminar on a selected topic in Chinese or Japanese history during the nineteenth and twentieth centuries. (Field vii)

Prerequisite: Permission of the Department.

Seminar three hours a week.

History 24.498

Mémoire de recherche

Un travail écrit dans le domaine de spécialisation d'un membre du département. Consultez le conseiller de "Mention: français" pour les sujets offerts.

For students of "Mention: français" only.

Permission of the "Mention: français" adviser required.

Precludes additional credit for History 24.499.

History 24.499 (2.0 credits)

Honours Research Essay

B+ standing in History courses is expected. The subject for research is settled in consultation with the Department and a supervisor is assigned. Written outline of the project submitted to the Honours Committee one week before the last day for course changes. Oral examination. Not available to students in a Combined Honours program.

Precludes additional credit for History 24.498.

Prerequisites: Registration in the Fourth-year of Honours History program and permission of the Department.

Human Rights (Arts and Social Sciences)

Academic Administration

Program Coordinator: To be announced

Sponsoring Departments

Law

Coordinator for Law: T. Brettel Dawson

Philosophy

Coordinator for Philosophy: Jay Drydyk

Political Science

Coordinator for Political Science: Fiona Robinson

Sociology/Anthropology

Coordinator for Sociology/Anthropology: Jared Keil

General Information

The Combined B.A. (Honours) in Human Rights is a multi-disciplinary program in which human rights are examined along four dimensions:

(a) human rights law, institutions and practices, (b) contexts of inequality and power, (c) ethical and theoretical issues and justifications of human rights, and (d) cultural and cross-cultural contexts. Students develop their analytical capabilities and understanding of human rights in ways that are both practical and theoretical, specialist and generalist, drawing from humanities as well as social sciences. Structured as a Combined Honours program, it provides interdisciplinary expertise in human rights while also requiring students to develop a disciplinary base for their studies.

In addition to Core courses, students will choose Human Rights Options courses on topics including: Canadian and international human rights law and institutions; gender difference and inequality; labour rights; racial, cultural and ethnic difference and inequality; indigenous peoples; human rights and development; regional human rights contexts; ethical, legal, and political theory pertaining to human rights.

Graduation Requirements

In order to graduate, students must fulfill all University graduation regulations (see p. 48), all Faculty regulations, including those relating to First-Year Seminars (see p. 63) and all Major regulations and requirements set out below. The B.A. requirement for breadth is waived for students in this program.

Combined B.A. (Honours) Program

The Combined B.A. (Honours) program in Human Rights requires a minimum of 7.0 credits (with at least 1.0 at 400-level) including:

Sociology/Anthropology 56.101 or (with permission of the Human Rights Program Coordinator) an appropriate First-Year Seminar; and

1. 1.5 Law credits including Law 51.215★ and two of: 51.353★, 51.359★, 51.364★, 51.412★, 51.464★
2. 1.0 Philosophy credits including Philosophy 32.213★ and one of: 32.211★, 32.212★, 32.236★, 32.313★, 32.330;
3. 1.0 Political Science credits, including Political Science 47.337★ and one of: 47.319★, 47.419★, 47.426★;
4. 1.0 credit in Sociology and Anthropology, from among: 56.202, 54.207★ or 56.307★; 56.234★, 56.246★, 53.345★, 53.347★, 56.465★

5. 0.5 credits in cultural and cross-cultural contexts, from among: History 24.170, 24.237, 24.260, 24.275, 24.278, 24.285, 24.286, 24.346★, 24.347★, 24.353★, Religion 34.100★, 34.101★, 34.205★, 34.216★, 34.235, 34.259★, 34.278★, Sociology/Anthropology 01.141, 54.207★, 54.249★ 56.361★, 54.476★, 56.479★

6. 1.0 credits chosen from among Human Rights Options (see list below)

Human Rights Options

Human Rights Law, Institutions and Practices: Law 51.205, 51.341★, 51.351★, 51.353★, 51.363★, 51.364★, 51.359★, 51.406★, 51.439★, 51.464★, 51.465★, 51.467★, Political Science 47.360★, 47.419★, Social Work 52.326★

Contexts of Inequality and Power: European and Russian Studies 55.402★, 55.408★, Geography 45.220★, 45.231★, 45.337★, History 24.281, 24.316★, 24.320, 24.335, 24.354★, 24.356★, 24.375★, 24.376★, Interdisciplinary Studies 04.441★, Political Science 47.260★, 47.306★, 47.310★, 47.311, 47.314★, 47.315, 47.320★, 47.324★, 47.352★, 47.415★, 47.423★, 47.425★, 47.426★, 47.450★, 47.455★, Social Work 52.211★, 52.311★, 52.325★, 52.412★, 52.414★, 52.430★, Sociology and Anthropology 56.202, 54.207★, 56.218★, 56.234★, 56.246★, 54.249★, 56.307★, 56.313★, 54.319★, 53.321★, 53.345★, 53.347★, 53.348★, 56.361★, 56.420★, 56.444★, 56.461★, 56.465★, 54.470★, 54.476★, 56.477★, 54.479★, Women's Studies 09.280★

Ethics and Political Theory: Philosophy 32.184★, 32.211★, 32.212★, 32.214★, 32.236★, 32.284★, 32.290, 32.311★, 32.312★, 32.313★, 32.330, 32.348★, 32.415/416★, 32.443/444★, 32.447/448★, Political Science 47.319★, 47.436★, 47.437★, Law 51.311★, 51.312★, 51.411★, 51.412★, 51.413★, 51.414★, 51.480★

Cultural and Cross-cultural Contexts: History 24.170, 24.237, 24.260, 24.275, 24.278, 24.285, 24.286, 24.346★, 24.347★, 24.353, Religion 34.100★, 34.101★, 34.205★, 34.216★, 34.235, 34.259★, 34.272★, 34.278★, First-Year Seminar in Sociology/Anthropology 01.141

Note: For Law requirements for the Combined B.A. (Honours) in Human Rights and Law, consult the Department of Law (see p. 314). For Philosophy requirements for the Combined B.A. (Honours) in Human Rights and Philosophy, consult the Department of Philosophy (see p. 374). For Political Science requirements for the Combined B.A. (Honours) in Human Rights and Political Science, consult the Department of Political Science (see p. 390). For Sociology and Anthropology requirements for the Combined B.A. (Honours) in Human Rights and Anthropology, or for the Combined B.A. (Honours) in Human Rights and Sociology, consult the Department of Sociology and Anthropology (see p. 437).

Humanities

(Arts and Social Sciences)

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Academic Adviser, B. Garner

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Adjunct Research Professors

Michel Gaulin • **D.R. Gardner**

General Information

This program offers a challenging inter-disciplinary study of the humanities. At the heart of the Bachelor of Humanities is a core curriculum whose purpose is to provide students with a comprehensive, challenging, and common educational experience that is focused on humanity's record of outstanding achievement. The program's unique features include core seminars in which all members of the College participate, a number of designated courses across a range of disciplines, the choice of four concentrations (Liberal Arts, History, Philosophy, and English Literature), as well as a collegial atmosphere to supplement formal course work. Graduates of the program will receive the degree of Bachelor of Humanities (Honours). They will have acquired a rigorous education in the liberal arts and an understanding of important cultural and political accomplishments of the past. They will have developed well-honed skills of thoughtful reflection, conversation, written composition, and informed criticism, as well as significant proficiency in another language.

The College offers a four-year (Honours) program, consisting of 20.0 credits. Students will participate in a common academic enterprise by being members of a core seminar in each of their four years. These core seminars are central to the coherence of the curriculum and to the purposes of the program. In addition, the curriculum is based on a number of designated courses permitting an introduction to key events, texts, works, and commentaries in philosophy, literature, history, art and music, science, classical civilization, anthropology, religion, politics, and economics.

Honours Program

The College of the Humanities offers a carefully coordinated four-year program in the liberal arts, leading to the degree of Bachelor of Humanities (Honours). The degree program comprises four Humanities Seminars and courses in Philosophy, Literature, History, Languages, and related disciplines.

Program Requirements

The Bachelor of Humanities degree requires presentation of 20.0 credits and satisfactory performance in the Fourth-year oral examination.

Courses are taken in one of four concentrations: Liberal Arts, Philosophy, English Literature, and History. Four Humanities Seminars (Humanities 02.100, Humanities 02.200, Humanities 02.300, and Humanities 02.400) are common to all four concentrations. In addition, students must successfully complete an intermediate language credit specified by the College in consultation with the appropriate department.

An oral examination, required of candidates for the Bachelor of Humanities, is taken in the Fourth or final year. Candidates will choose 12 primary and 12 important secondary texts on which to be examined, from a list provided to them in their first year. The examination is offered once a year at the end of the Winter term.

The Humanities Seminars

The Humanities Seminars constitute a four-stage program of study that leads students from a consideration of fundamental elements of human consciousness Myth and Symbol (Humanities 02.100) into a sequential examination of important themes in the major epochs in western civilization: Antiquity to the Middle Ages (Humanities 02.200), Renaissance to Romanticism (Humanities 02.300), Napoleonic Empire to the Present (Humanities 02.400). The seminars are defined under the categories "Myth and Symbol," "Reason and Revelation," "Culture and Imagination," "Science, Language, and Power." Disciplinary perspective and thematic emphasis shift from one seminar to another. Humanities 02.100 concentrates primarily on religion and mythology, Humanities 02.200 on philosophy, Humanities 02.300 on literature and the fine arts, and Humanities 02.400 on historical consciousness. Each seminar consists of three hours of lectures and two hours of tutorials each week and entails study of a select number of primary texts and works (for example, Homer's *Iliad* and *Odyssey*, Plato's *Republic*, St. August-

tine's *City of God*, the *Koran*, Dante's *Divine Comedy*, Titian's *Bacchus and Ariadne*, Shakespeare's *King Lear*, Mozart's *The Magic Flute*, Rousseau's *Emile*, Beethoven's *Eroica Symphony*, Mary Wollstonecraft's *A Vindication of the Rights of Woman*, Marx's *Communist Manifesto*, Thomas Mann's *Doktor Faustus*, Margaret Laurence's *The Diviners* and an examination of important secondary works (such as George Grant's *Lament for a Nation*, Harold Innis's *Empire and Communications*).

Program Concentrations

Upon entering the program, candidates for the Bachelor of Humanities degree choose one of four concentrations of courses as their program of study.

The Liberal Arts Concentration (Option One) is designed for students who wish to receive a comprehensive education in the humanities. The remaining three concentrations are designed for students who wish to receive a balanced background in the humanities with a higher degree of specialization in one discipline. These three concentrations, in most cases constituting the equivalent of a combined Honours degree in the chosen discipline, will prepare students for admission to graduate studies in that discipline. Each Concentration comprises the Humanities Seminars and 16.0 additional prescribed credits. In the Second, Third, and Fourth years, students will have the choice of one elective credit (except that in the fourth year of the History Concentration, the elective will be replaced by an additional fourth-year History seminar. Under certain circumstances, and with the permission of the College Academic Advisor, students may offer a maximum of 2.0 credits in performance as their elective credits. Please note that these credits may not be transferred if students transfer to other programs.

In consultation with the College Academic Advisor, students may elect to pursue a concentration in one or more languages. The number of credits obtained in a language concentration is the same as that which is normally attained in a combined honours program. The College Academic Advisor has several templates for such a course of study.

Admission Requirements

Admission to the program is by demonstrated scholarly achievement and potential. In addition to applying to Carleton University through the Ontario Universities Application Centre, prospective students must submit a portfolio consisting of a) a one-page statement of why they wish to enter the program, b) a 750-word essay based on reflections on the theme or book chosen each year by the College, and c) if desired, two or three samples of additional creative work. The portfolio should be submitted to the College of Humanities, Carleton University by February 1. Students wishing to enter the program normally must have the OSSD, or the equivalent, including six OACs (or their equivalent), with an overall average of 80 percent or better. Since program enrolment is limited, satisfying the minimum admission requirements does not guarantee admission to the program. At the discretion of the College's Committee on Admissions, students who do not meet the 80 percent average may nonetheless be admitted to the program if their portfolio is deemed outstanding.

Advanced Standing and Transfer of Credits

Applications for admission with advanced standing to the program leading to the Bachelor of Humanities degree will be evaluated individually. Advanced standing will be granted only for those courses that are determined to be appropriate for the Bachelor of Humanities program. On admission to the Bachelor of Humanities program, students will not receive credit for courses graded below C-.

Academic Standing and Continuation in the Program

Students are considered to be in good standing if they meet the following criteria:

1. A CI of 6.00;
2. a cumulative GPA of 8.0;
3. a grade of B- or better in each of the Humanities Seminars;
4. no grade of D, F, or Abs in more than 1.0 credit per calendar year.
5. a minimum of 4.0 credits must be completed by the end of the academic year, i.e. at the end of the summer session.

Calculation of the GPA is based on all successfully completed courses from all academic years in which the student has been registered in the Bachelor of Humanities program. In the case of repeated courses, the most recent grade will be used to compute the GPA.

Graduation Requirements

In order to fulfill the minimum graduation requirements for the degree of Bachelor of Humanities, a candidate must have met all the program requirements for the First to Fourth years, inclusive, with a cumulative GPA of 8.0 or better. In addition, the candidate must have achieved a grade of Sat in the Fourth-year oral examination.

In order to graduate, students must fulfill all University graduation regulations (see p. 48) in addition to all program regulations.

Program Concentrations

There are four concentrations available within the Humanities program.

Option One: Liberal Arts Concentration

First Year: Myth and Symbol

- Humanities 02.100 Myth and Symbol
- Classical Civilization 13.200 Classical Mythology
- Language Requirement: Normally Greek 15.220 ★ and 15.221 ★, or Latin 16.220 ★ and 16.221 ★, or French 20.160, or German 22.205, or Italian 26.200, or Religion 34.292, or Russian 36.202, or Spanish 38.203, chosen in consultation with the College Academic Adviser. Students may need to fulfill a prerequisite before taking these courses.
- Religion 34.126 Interpretations of Religion
- Anthropology 54.100 Introduction to Anthropology

Second Year: Reason and Revelation

- Humanities 02.200 Philosophy: Antiquity to the Middle Ages
- Classics 13.209 Greek and Roman Literary Genres
or
History 24.221 History of Science or Art History 11.222 ★
Medieval Art and 11.311 ★ Studies in Greek and Roman Art and Archaeology
- History 24.210 Introduction to the History of Ideas
or
Philosophy 32.206 ★ Greek Philosophy: Plato and Aristotle and Philosophy 32.207 ★ Hellenistic and Early Medieval Philosophy
or
Political Science 47.230 History of Political Thought
- Religion 34.228 From Christ to Constantine And 1.0 credit to be determined in consultation with the College Advisor

Option One: Liberal Arts Concentration			
First Year	Second Year	Third Year	Fourth Year
Humanities 02.100	Humanities 02.200	Humanities 02.300	Humanities 02.400
Classics 13.200	Classical Civilization 13.209 or History 24.221	Humanities 02.310	Humanities 02.410
Language Requirement**	History 24.210 or Philosophy 32.206 ★ and 32.207 ★ or Political Science 47.230	Humanities 02.320	History 24.310
Religion 34.126	Religion 34.257 ★ and 34.258 ★ or 34.259 ★	English 18.230	Philosophy 32.255 ★ and 32.315 ★ or Philosophy 32.306 ★ and 32.307 ★ or Philosophy 32.314 ★ and 32.402 ★
Anthropology 54.100	1.0 credit*	1.0 credit*	1.0 credit*
*To be determined in consultation with the College Advisor.			
**Language Requirement: Normally Greek 15.220 ★ and 15.221 ★, or Latin 16.220 ★ and 16.221 or French 20.160 or 01.108, or German 22.205, or Italian 26.200, or Religion 34.292, or Russian 36.202, or Spanish 38.203, chosen in consultation with the College Academic Adviser. Students may need to fulfill a prerequisite before taking these courses.			

Third Year: Culture and Imagination

- Humanities 02.300 Literature and the Arts: Renaissance to Enlightenment
- Humanities 02.310 Art, Music, Architecture: Renaissance to Romanticism
- Humanities 02.320 The Literature of Continental Europe
- English 18.330 British Literature from the Renaissance to the Romantics
- And 1.0 credit to be determined in consultation with the College Advisor.

Fourth Year: Science, Language and Power

- Humanities 02.400 History: Napoleonic Empire to the Present
- Humanities 02.410 Principles of Modern Science
- History 24.310 or 24.388 Historical Theory and Methods or 24.320 Freedom and Power in the Western World 1840-1880 or Political Science 47.436 ★ Concepts of Political Community I and 47.437 ★ Concepts of Political Community II
- Philosophy 32.254 ★ Language and Communication and 32.315 ★ Analytic Philosophy or Philosophy 32.306 ★ German Idealism and Philosophy 32.307 ★ Reaction to German Idealism or Philosophy 32.314 ★ The Roots of Analytic Philosophy and Philosophy 32.458 ★ Special Topic in Philosophy of Social Science or 32.459 ★ Special Topic in Philosophy of Social Science
- And 1.0 credit to be determined in consultation with the College Advisor

Option Two: Philosophy Concentration

First Year: Myth and Symbol

- Humanities 02.100
- Classics 13.200 or Religion 34.126
- Language requirement: Normally Greek 15.220 ★ and 15.221 ★,

or Latin 16.220 ★ and 16.221 ★, or French 20.160, or German 22.205, or Italian 26.200, or Religion 34.292, or Russian 36.202, or Spanish 38.203, chosen in consultation with the College Academic Adviser. Students may need to fulfill a prerequisite before taking these courses.

- Philosophy 32.160
- Anthropology 54.100

Second Year: Reason and Revelation

- Humanities 02.200
- Classical Civilization 13.209 or History 24.221 or Art History 11.222 ★ and 11.311 ★ or History 24.210 or Philosophy 32.206 ★ and 32.207 ★ or Political Science 47.230
- 1.0 Credit from: Philosophy 32.201 ★, Philosophy 32.286 ★, Philosophy 32.206 ★, 32.207 ★, Philosophy 32.208 ★, 32.301 ★, Philosophy 32.261 ★
- Religion 34.228 ★
- 1.0 Credit Elective

Third Year: Culture and Imagination

- Humanities 02.300
- Humanities 02.310
- Humanities 02.320
- Philosophy 32.209 ★ and 32.304 ★
- 1.0 Credit Elective

Fourth Year: Science, Language and Power

- Humanities 02.400
- Humanities 02.410
- History 24.310 or Philosophy 32.254 ★ and 32.315 ★ or History 24.388 or 24.320 or Political Science 47.435 or 47.436 ★ and 47.437 ★ or two of: Philosophy 32.413 ★, 32.414 ★, 32.415 ★, 32.416 ★, 32.405 ★ and 32.406 ★.
- Philosophy 32.306 ★ and 32.307 ★; or Philosophy 32.314 ★ and Philosophy 32.458 ★ or 32.459 ★
- 1.0 Credit Elective

Option Three: English Literature Concentration

First Year: Myth and Symbol

- Humanities 02.100
- Classical Civilization 13.200
- English 18.208
- Language Requirement: Normally Greek 15.220★ and 15.221★, or Latin 16.220★ and 16.221★, or French 20.160, or German 22.205, or Italian 26.200, or Religion 34.292, or Russian 36.202, or Spanish 38.203, chosen in consultation with the College Academic Adviser. Students may need to fulfill a prerequisite before taking these courses.
- Religion 34.126 or Anthropology 54.100

Second Year: Reason and Revelation

- Humanities 02.200
- English 18.209 or English 18.322★ and 18.428★
- History 24.210 or 24.221 or Art History 11.222★ and 11.311★ or Philosophy 32.206★ and 32.207★ or Political Science 47.230
- Religion 34.228
- 1.0 Credit Elective

Third Year: Culture and Imagination

- Humanities 02.300
- Humanities 02.310 or Humanities 02.320
- English 18.330
- English 18.332★ and 18.342★ or English 18.334
- 1.0 Credit Elective

Fourth Year: Science, Language and Power

- Humanities 02.400
- Humanities 02.410
- 1.0 credit from: English 18.264, English 18.352, English 18.353★, English 18.361★, English 18.363★
- 1.0 credit from: English 18.482★, English 18.483, English 18.486★, English 18.488★
- 1.0 Credit Elective

Option Four: History Concentration

First Year: Myth and Symbol

- Humanities 02.100
- Classical Civilization 13.200 or Religion 34.126
- Language Requirement: Normally Greek 15.220★ and 15.221★, or Latin 16.220★ and 16.221★, or French 20.160, or German 22.205, or Italian 26.200, or Religion 34.292, or Russian 36.202, or Spanish 38.203, chosen in consultation with the College Academic Adviser. Students may need to fulfill a prerequisite before taking these courses.
- History 24.101
- Anthropology 54.100

Second Year: Reason and Revelation

- Humanities 02.200
- 2.0 Credits from: Classical Civilization 13.209, History 24.221,

Classics 13.290, Classics 13.291, History 24.306★, History 24.307★, History 24.210, Philosophy 32.206★, 32.207★, Political Science 47.230, History 24.205

- Religion 34.228
- 1.0 Credit Elective

Third Year: Culture and Imagination

- Humanities 02.300
- Humanities 02.310 or Humanities 02.320
- English 18.330
- History 24.315★ and History 24.378★ or History 24.223 or History 24.388
- 1.0 Credit Elective

Fourth Year: Science, Language and Power

- Humanities 02.400
- Humanities 02.410
- History 24.310 or 24.388 or 24.320
- 2.0 History credits at the 400-level

Courses

Not of all the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Humanities 02.100

Myth and Symbol

Recurring symbols in myth, epic and ritual representing the relation between the sacred and the profane, the origin of the cosmos, the basis of community, and formative human experiences. Primary sources drawn from ancient India and China, Greek epic, Hebrew Scripture, and aboriginal practices.

Lectures three hours a week and tutorials two hours a week.

Humanities 02.200

Reason and Revelation: Antiquity to the Middle Ages

Philosophical and theological speculation in the Western world. Themes include knowledge and faith, justice and charity, the origin of the university, and the rise and fall of empires. Primary sources are drawn from Greek and Roman works, patristic theology, Muslim Scripture, medieval philosophy and literature.

Prerequisites: Humanities 02.100 and good standing in the Bachelor of Humanities program.

Lectures three hours a week and tutorials two hours a week.

Humanities 02.300

Culture and Imagination: Renaissance to Romanticism

Major forms of literary, artistic, and philosophical expression from 1500-1800. Sources drawn from renaissance humanism, reformation theology, enlightenment and romantic philosophy.

Prerequisites: Humanities 02.200 and good standing in the Bachelor of Humanities program.

Lectures three hours a week and tutorials two hours a week.

Humanities 02.310

Art, Music, Architecture: Renaissance to Romanticism

An examination of the major artistic, musical, and architectural movements since the fifteenth century. Students will gain familiarity with the significant cultural works and monuments, as well as the theoretical understanding which guided their composition and construction.

Lectures three hours a week.

Humanities 02.320

The Literature of Continental Europe: Renaissance to Romanticism

Major movements and works from Dante's Divine Comedy through Voltaire's *Candide*. Themes include the New Humanism vs. old Chivalry in the Renaissance and Baroque periods; the rise of the modern novel and drama; reason, nature, and the Enlightenment project.

Prerequisites: Humanities 02.200 and Third-year standing in the B.Humanities program.

Lectures three hours a week

Humanities 02.400

Science, Language, and Power: Napoleonic Empire to the Present

Politics, ideology, science, and technology of Western modernity. New forms of social authority, politics of revolution, philosophy of language, evolution of the nation-state, the rise of psychoanalysis. Sources drawn from German philosophy, economics, sociology, and psychoanalysis, and from the works of modernism and post-modernism.

Prerequisites: Humanities 02.300 and good standing in the Bachelor of Humanities program.

Lectures three hours a week and tutorials two hours a week.

Humanities 02.401 ★

Directed Studies in the Humanities

A course for independent study and writing, under the supervision of a College designated faculty member. This course involves supervised readings and written essays.

Prerequisites: Fourth-year standing in the Bachelor of Humanities program and good standing in the program.

Humanities 02.402 ★

Directed Studies in the Humanities

A course for independent study and writing, under the supervision of a College designated faculty member. This course involves supervised readings and written essays.

Prerequisites: Fourth-year standing in the Bachelor of Humanities program and good standing in the program.

Humanities 02.410

Principles of Modern Science

A detailed investigation through laboratory experimentation and theoretical inquiry of the major principles of modern science. Students will acquire an understanding of the significant issues confronted in modern biology, physics, and chemistry.

Lectures two hours a week, laboratories two hours a week, and discussion groups one hour a week.

Industrial Design

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Assistant Professor
R. Nielsen, B.Sc. (Manitoba), M.E.Des. (Calgary)

Adjunct Research Professor
T. Moore, Ergosum

Sessional Lecturers
S. Field • J. Mahan • T. Moore • G. Abraszko • B. Ebbinghaus

General Information

Industrial design* is a creative activity, which aims to determine the formal qualities of objects produced by industry. These formal qualities include the external features, but are principally those structural and functional relationships that convert a system to a coherent unit, both from the point of view of the producer and of the user.

Industrial design tends to embrace all aspects of the human environment that are conditioned by industrial production. In the future, the traditional activity of design for growth may continue to be essential. It will be necessary, however, to develop a design activity that contributes to the regulating of growth processes, the conservation of resources and the protection of the environment.

* As defined by the International Council of Societies of Industrial Design.

Bachelor of Industrial Design Degree Program

In September 1973, Carleton University initiated the First year of a new four-year program leading to the Bachelor of Industrial Design degree.

The Bachelor of Industrial Design degree is awarded on successful completion of the four-year program of studies. The program is structured to meet the requirements of the developing profession of industrial design. This implies an education with a solid general background, enabling the designer to communicate with experts in other disciplines. It also implies development of expertise in designing for one or more specific sectors in the wide field of application of industrial design. The program of studies was initiated as a joint venture of the Faculty of Engineering and the School of Architecture.

Admission Requirements

First Year

The OSSD or the equivalent, with an average of 65 percent or better, including six OACs. The six OACs must include a core of Physics, Algebra and Geometry, and Calculus with an average of 65 percent or better. It is strongly recommended that all applicants also have OACs in Chemistry and English.

In order to compete successfully for admission in this limited enrolment program, it is strongly recommended that the candidate present a portfolio of any kind of work that could demonstrate the applicant's creativity and aptitude for the study of industrial design. Candidates are normally expected to make arrangements for a personal interview at the School. Such an interview will give the School of Industrial Design a clearer idea of the seriousness of the candidate and afford the candidate an opportunity to see and learn actively about the program of the School of Industrial Design.

Advanced Standing and Transfer of Credits

Applicants seeking admission with advanced standing to the Bachelor of Industrial Design program will be evaluated on an individual basis. Applicants may not be required to present any or all of the OAC prerequisites if it is determined that their previous post-secondary studies are sufficient preparation for the program.

Mature Applicants

Persons who lack the normal entrance requirements as published in this Calendar but who have been away from full-time studies for a minimum of two years and who are 21 years of age or over by December 31 of the year in which they wish to enrol, may receive consideration for admission to a degree program.

Selective Admission

It should be noted that the number of student spaces in the School of Industrial Design is limited. Because of this, it may not be possible to grant admission to all applicants who meet the foregoing requirements. Admission, therefore, will be on a selective basis with preference given to those candidates who show the highest promise of success in the program.

Readmission

Students who have been absent from the program for one Fall/Winter session are normally required to apply for readmission before registration. Exceptions will be made in the case of students holding either a Letter of Permission or written approval from the School of Industrial Design.

Former students who have forfeited their undergraduate status must request readmission by following the normal admission procedures, including the submission of an updated portfolio of work.

Co-operative Industrial Design Experience Program

General information on Co-op programs can be found on p. 39.

Students in the Bachelor of Industrial Design (BID) program have the opportunity to enrol in a Co-operative Industrial Design Experience option (co-op option). Students admitted to this program must satisfy the normal requirements for graduation in the BID program and, in addition, the graduation requirements specific to the co-op program.

First Year

Term	Lectures and Tutorials		Laboratory and Studio Work	
	Fall	Winter	Fall	Winter
43.100 Introduction to Economics	3	3	-	-
49.101 ★ Introduction to Psychology I	3	-	-	-
49.102 ★ Introduction to Psychology II	-	3	-	-
69.107 ★ Elementary Calculus I	4	-	-	-
69.117 ★ Elementary Algebra	-	4	-	-
75.104 ★ Introductory Physics for Engineering	-	3	-	3
85.100 ★ Introduction to Industrial Design	3	-	-	-
85.101 ★ Industrial Design Analysis	-	3	-	-
85.130 ★ Projects IA	2	-	4	-
85.131 ★ Projects IB	-	2	-	4
91.111 ★ Mechanics - Statics	3	-	3	-
Hours per week	18	18	7	7

Second Year

Term	Lectures and Tutorials		Laboratory and Studio Work	
	Fall	Winter	Fall	Winter
49.372 ★ Perception	-	3	-	-
85.211 ★ Mass-Production Technology for Industrial Design A	3	-	3	-
85.212 ★ Mass-Production Technology for Industrial Design B	-	3	-	3
85.215 ★ Computer Applications for Industrial Design	3	-	-	-
85.231 Projects IIA	4	-	8	-
85.232 ★ Projects IIB	-	2	-	4
85.260 ★ Ergonomics for Industrial Design	-	3	-	-
Electives (Note a)	3	3	(3)	(3)
Electives (Note b)	3	-	-	-
Hours per week	16	14	11(14)	7(10)

Note a: Course(s) to a total of 1.0 credit chosen from Architecture, Business, Computer Science, Engineering, Psychology or Technology, Science and Environment.

Note b: Total course value of 0.5 credit.

The program is based on the principle that work experience obtained after acquiring instruction fundamental in their discipline, is a valuable component of a professional program. The experience will expose students to practical issues that will provide relevance for material that is presented in the final year of academic instruction. The practical experience is not a substitute for, but complements, their academic studies.

Operation of the Co-op program

The program structure is summarised in the following table:

Calendar Year	Fall	Winter	Summer
1	Study Term 1	Study Term 2	
2	Study Term 3	Study Term 4	Work Term 1
3	Study Term 5	Study Term 6	Work Term 2
4	Work Term 3	Work Term 4	Work Term 5
5	Study Term 7	Study Term 8	

Precise start and completion dates are set in consultation with the employer.

Students wishing to have a co-op option designation on their transcript must participate in a minimum of three work terms with each work term having a nominal duration of four months.

Students may choose any combination of work terms.

Third Year	Lectures and Tutorials		Laboratory and Studio Work	
	Fall	Winter	Fall	Winter
42.224 ★ Basic Marketing	-	3	-	-
85.330 Projects IIIA (Note a)	4	-	8	-
85.331 Projects IIIB (Note a)	-	4	-	8
85.352 ★ Contextual Nature of Products	-	3	-	-
85.361 ★ Industrial Design and the User	3	-	3	-
Electives (Note b)	6	3	3	3
Hours per week	13	13	14	11

Note a: The project courses, although given in one term each, are counted as full courses with 1.0 credit each.

Note b: Total course value to 1.5 credits.

Fourth Year	Lectures and Tutorials		Laboratory and Studio Work	
	Fall	Winter	Fall	Winter
85.400 ★ Professional Practice in Industrial Design	-	3	-	-
85.401 ★ Industrial Design Seminar (Note a)	3	-	-	-
85.430 Major Projects (Note b)	2	2	10	10
95.431 ★ Minor Projects A	2	-	4	-
85.432 ★ Minor Projects B	-	2	-	4
85.440 ★ Industrial Practice Internship Field Reports	3	-	-	-
Electives (Note c)	3	3	-	-
Hours per week	13	10	14	14

Note a: Although the Industrial Design Seminar takes place in the Winter term, the preparatory work that students are required to do must be completed in the Fall term, and therefore requires registration in that term.

Note b: The Major Industrial Design Projects course has a value of 2.0 credits.

Note c: The electives must be chosen in consultation with the School on the following principles:

- (i) the elective chosen should serve to deepen the student's understanding of fields related to Industrial Design or disciplines that are relevant for industrial designers;
- (ii) the elective chosen should preferably be an advanced course;
- (iii) the elective chosen should preferably be related to the Industrial Design projects and provide basic and/or actual information for these projects.

Upon satisfactory completion of the option, students will receive the designation B.I.D.(Co-operative Industrial Design Experience Option) on their transcripts.

Admission Requirements and Registration Information

Students satisfying the following conditions will be considered admissible to the co-op option subject to a satisfactory interview with the School. The School's interview is an essential component of the admission process and students must demonstrate a mature professional attitude to successfully enter the co-op option. The requirements are as follows:

Students must:

- a) normally have obtained a cumulative GPA of 8.0 in their industrial design courses (prefix 85.XXX) and an overall average of 6.5 in their university studies;
- b) be registered as a full-time student;
- c) be eligible to work in Canada;
- d) have successfully completed an interview with the School.

Students must apply to the program by the first week of the winter term preceding their first work term.

Note that meeting the above requirements only establishes eligibil-

ity for admission to the program. The prevailing job market may limit enrolment in CIDEP.

CIDEP Work Term Fee

Fees will be in accordance with the Co-op Office fee structure.

Employment

Although every effort is made to find a sufficient number of placements for all students admitted to the co-op option, no guarantee of employment can be made. The employment process is competitive, and academic performance, skills, motivation, maturity, attitude and potential, will determine whether a student is offered a job.

Registration during Work Terms

Students in the co-op option must be registered as full-time students in the Bachelor of Industrial Design program in all academic terms of the co-op option. While on work terms students must be registered in one of the following report courses:

- 85.241 ★ Work Term 1
- 85.342 ★ Work Term 2
- 85.343 ★ Work Term 3
- 85.344 ★ Work Term 4
- 85.345 ★ Work Term 5

These courses carry no academic course credit. Work term credits are noted on the academic record.

Assessment of Work Terms

The student must submit a satisfactory work term report and receive a satisfactory evaluation from the employer to achieve successful completion of a work term. A grade of *Sat* or *Uns* for the work-term course will be assigned by the Co-op faculty advisor. A grade of *Uns* will not affect a student's academic progress, but will normally result in the student being required to withdraw from the co-op option. Normally the report(s) will take the form of a progress report and will subsequently be used in a more comprehensive written document (See 85.440 ★ requirements). Employers may require other reports from students as part of their job requirements.

Continuation in the Co-op Option

Once admitted to the co-op option students must:

- maintain full-time status in each study term,
- meet the academic standards required to continue in the co-op program,
- achieve successful completion of work terms,
- accept positions which have been awarded,
- attend all pre-arranged interviews with employers,
- pay the work term fee by the appropriate due date.

Students who fail to meet any of these requirements may be required to withdraw from the co-op option.

Students who are required to withdraw from the co-op option will be eligible to continue in the BID program provided they meet the minimum program requirements.

Appeals

The Co-op Program Administrator administers the regulations and procedures applicable to the Co-op option. The administrator will report any instances of a student failing to report to a placement or being required to withdraw from the co-op program for any reason, to the School's Student Standing and Promotion Committee for final decision. A letter of the decision will notify the student. The decision may be appealed through the normal appeal channels of the University.

Industrial Practice Internship

In order to provide the student with a realistic view of the possibilities and limitations of industry, and to establish and maintain good contacts and communication among the School of Industrial Design, the students and industry, the student in Industrial Design is required to spend a period of time as an intern in industry.

These periods of industrial practice internship are to be taken prior to graduation. Students should find an internship on their own initiative and confirm its suitability with the faculty member involved.

If the industrial practice internship is not completed in time or if it is not proved successful, the student will not be awarded the Bachelor of Industrial Design degree until the missing internship is completed and proof of satisfactory results is given.

During the industrial practice internship, a study of the relationship between industrial design and the technology, production process, or functional issues at hand will be undertaken. A report is to be submitted to the School, to be filed in the technical data facilities of the School of Industrial Design and made accessible to other students. See course Industrial Design 85.440 ★.

Industrial Design Projects

The Industrial Design projects in the First, Second, Third and Fourth years will represent either real or simulated situations to be developed to the stage of drawings, models, full-scale mock-ups or simulated finished products, as appropriate.

The design experience in Industrial Design projects synthesizes and integrates all the other course work and draws on the resources from those courses, including the disciplinary expertise of the staff. It should also attempt to explore and exploit knowledge available on campus and from other institutions.

Industrial design projects, including research-oriented projects, will only be acknowledged when they are aimed at predetermined, concrete goals and, preferably, result in objects to be made by industry.

The usual pattern of activities in the execution of an Industrial Design project is, in its simplest form, composed of three phases:

1. an analytical informative phase;
2. a creative or formative phase;
3. a descriptive or communicative phase.

Progress within this pattern of activities is made by feedback and feed-forward with intermediate evaluations. A project will not be considered complete if any of the three major phases has not been documented and evaluated.

The student will normally be required to keep a record of working hours spent on the project. This record must be available for inspection, and must be one of the documents submitted for examination.

The School of Industrial Design may conditionally approve an intended collaboration of students in the execution of Industrial Design projects provided that proper means of evaluation and examination are built into the project to ensure the identification of each student's contribution.

Industrial Design projects will be reviewed or examined after each of the phases and on the planned and agreed deadlines. Students who do not meet the deadlines for submission of project work will be considered to have withdrawn from examination.

The execution of Industrial Design projects will require professional equipment for sketching, drawing, modelling, etc. A list of recommended equipment is available from the instructors of each project course, where applicable. Other possible costs such as travel expenses, will cause the total expenditure for projects to vary considerably.

Resulting documents, sketches, drawings, models, etc. from Industrial Design projects must be retained by the student for a minimum period of two years after production. During this period, the student must have these results available in good condition for the School of Industrial Design for exhibition, display or publication purposes. During this time, the student will be required to advise the Director of the School, well in advance, about any transaction, exhibition, display or publication, that will involve these results.

Students are not allowed to use the results of Industrial Design projects for commercial purposes without written permission of the Director of the School of Industrial Design.

Fourth-Year Industrial Design Projects

All regulations and arrangements as described under "Industrial Design Projects" apply to the Fourth-year projects. Over and above these regulations, Fourth-year Industrial Design projects are subject to the following:

In order to reflect the actual situation of the professional industrial designer, the student is required to undertake more than one project to be executed simultaneously in Fourth Year.

Therefore, Fourth-year students are required to undertake Industrial Design 85.430, Major Projects, 85.431 ★, Minor Projects A, and 85.432 ★, Minor Projects B in the same academic year.

Fourth-year Industrial Design projects are conducted, supervised, administered and examined by the Industrial Design Projects Committee, reporting to the Faculty Board of the School of Industrial Design.

The subjects or themes of Industrial Design projects in 85.430 are determined by agreement between the student and the Industrial Design Projects Committee. This agreement should be reached before the commencement of the Fall term in the Fourth year.

A student who chooses to do an Industrial Design project that is based on special techniques or technologies, is required to propose an expert in that special field to be present at the evaluations of the project to assist the Industrial Design Projects Committee.

Students registering in Fourth year, who have failed to reach an agreement with the Industrial Design Projects Committee before the commencement of the Fall term will normally be given a subject or theme by the Committee.

The specified record of working hours spent on Fourth-year Industrial Design projects must be available for inspection by the Committee at any time and be among the documents to be submitted at the final examination.

General Information

Course Pattern

The program of study in Industrial Design is necessarily structured to meet the requirements in education and training for a professional career in industrial design.

For purposes of scheduling, each student is considered as being in a particular year of the program. In order to move through the program, a student must not be deficient in the Industrial Design project course(s) and in no more than one of the other courses. This requirement does not relate to a student's academic status, but only to the nominal year designation. However, a student who is taking courses in Fourth year while designated as being in Third year, has the responsibility for satisfactorily resolving any prerequisite deficiencies and difficulties in the course program.

Course Level

The year level of a course can be read from the first digit to the right of the decimal in the course number; for example, the course Industrial Design 85.331 is at Third-year level and 85.430 is at Fourth-year level. This indicates the general academic background required. Specific prerequisites are also given where appropriate. Students may take courses at a year level higher than their current registration; they are advised, however, to consult the course instructor if they have doubts regarding their background preparation. In some cases, the School of Industrial Design may also be able to waive specific prerequisites.

Electives

The School of Industrial Design offers elective courses under its own jurisdiction. It is strongly recommended, however, that students in Industrial Design also choose from the wide variety of courses in the humanities, social sciences, engineering or multi-disciplinary courses offered in the University. Industrial Design projects usually represent complex situations which require background information that often will be better understood when supported by appropriate elective courses in other disciplines.

Qualifying-University Year Courses

Qualifying-University year courses cannot be used to satisfy any of the elective requirements in any year of the regular course pattern.

Student Responsibility

The student is responsible for knowing the regulations of the School of Industrial Design and for complying with them. Any exceptions to the regulations must be approved in writing by the School of Industrial Design Student Standing and Promotion Committee.

Instructional Television

Instructional Television offers an alternative mode of access to courses offered at Carleton University. Your learning experience at Carleton University may include a mix of on-campus and television courses. For detailed information about itv refer to p. 57.

Carleton Industrial Design Students' Association

CIDSA organizes social and academic events to develop esprit de corps among Industrial Design students and faculty. The association also represents students within the School of Industrial Design regarding academic and/or policy matters to the University and the profession.

Grading System

Standing in courses will be determined by the School and will be shown by alphabetical grades. (See p. 47)

Notations to represent special circumstances are as follows:

Aeg

Aegrotat standing is a pass standing granted despite absence from the final examinations. It may be granted by the Committee on Student Standing and Promotion of the School of Industrial Design only in response to a student's written request. Aegrotat standing will be granted only in exceptional circumstances and if the term work has been of high quality.

F

Failure: no academic credit.

Wdn

Withdrawn in good standing: no academic credit.

Abs

Absent from formally scheduled final examinations where the necessary term work has been completed. No academic credit.

Def

Students who are absent from final examinations or who are unable to complete their course work for medical or compassionate reasons may apply to the Committee on Student Standing and Promotion of the School of Industrial Design for deferred examination privileges. Such applications must:

1. be made in writing to the Engineering Faculty Registrar's Office not later than one week after the date of the examination; and
2. be fully supported in the case of illness by a medical certificate or by appropriate documents in other cases.

Academic Standing, Promotion and Probation

The academic standing of each student in the B.I.D. program will be reviewed prior to fall registration. At that time, the student's previous record, including courses from the preceding Summer session, will be considered.

GPA's and cumulative GPA's determine the academic standing of a student. They are calculated on the basis of course credits. Nor-

mally, a full (two-term) course has a value of 1.0 credit and a half (one-term) course, indicated by a ★ after the course number, has a value of 0.5 credit. In the B.I.D. program, the courses Industrial Design 85.231, 85.330 and 85.331, although offered in one term, have a course value equivalent to 1.0 credit each. The course Industrial Design 85.430 has a course value equivalent to 2.0 credits.

The 12-grade point system is set out on p. 48. The grade points earned in any specific course are determined by multiplying the grade points corresponding to the grade by the credit value of the course. Thus an A+ in a half-credit course will earn the student 6.0 grade points, while an A+ in a two-credit course would be worth 24 grade points. GPAs are calculated by dividing the total accumulated grade points by the total credits.

To achieve satisfactory academic standing, the student must:

1. meet the GPA for the year of study just completed;
2. meet the cumulative GPA required for all courses taken as part of the Bachelor of Industrial Design program.

The required cumulative GPA and the GPA for the year are:

- 2.5 after one year of study;
- 2.8 after two years of study;
- 3.1 after three years of study;
- 3.4 after four years of study.

A year of study, as used here, refers to the student's period of study and not to the program year defined in the previous section of these regulations. A year's GPA is based on all courses taken during one Academic Year; calculation of the cumulative GPA is based on the courses from all Academic Years in which the student has been registered in Industrial Design. The most recent grade obtained in each course will be used to compute the GPA.

3. have completed all course requirements of First and Second years to be eligible to proceed to Third-year project courses. Students must have completed all industrial design courses of third year to proceed to Fourth-year project courses.

4. not receive a grade of F or Abs in the year of study just completed in more courses than the allowable numbers listed below:

Number of Full Credit Equivalents	Maximum Number of Full Credit Equivalent F or Abs Taken Allowed
0.5—1.0	0
1.5—2.5	0.5
3.0—4.0	1.0
4.5—5.5	1.5
6.0 or more	2.0

5. achieve a GPA of 4.0 or better in each of the project courses.

After a review of grades, a student who no longer meets the requirements for satisfactory academic standing, will be placed on academic probation. A student may be on academic probation only once in the Bachelor of Industrial Design program.

A student on probation for reasons other than failure of a project course will not be allowed to register in any project courses.

A student on probation will be required to successfully complete the following courses from the previous year of registration:

1. any project course of the core program for which a grade less than C- was obtained;
2. any other core course that was failed.

Moreover, the student will be required to repeat or to replace any elective course of the previous year's registration that was failed.

A student on probation who fails to meet these conditions will lose undergraduate status and will be ineligible for future registration in the B.I.D. program.

Students with Advanced Standing

Students admitted with advanced standing must obtain an average appropriate to their level of admission but only those courses taken at Carleton University will be included in the evaluation.

Graduation

In order to fulfill the minimum graduation requirements for the degree of Bachelor of Industrial Design, a candidate must have met all the course requirements of the First to Fourth years, inclusive, with a cumulative GPA of 3.4 or better. In addition, the candidate must have achieved a GPA of 4.0 or better in each of the Industrial Design project courses and be recommended by the School of Industrial Design.

In order to graduate, students must fulfill all University graduation regulations in addition to all School regulations. (See p. 48.)

Degrees with Distinction

Upon recommendation of the School of Industrial Design, the notation "with High Distinction" may be made on the academic records of a candidate for the degree of Bachelor of Industrial Design. To be considered for this recommendation, the candidate is expected to obtain a GPA of 10.0 or better in the course requirements of the final year and, in addition, a GPA of 7.8 or better in the course requirements of the First to Fourth years, inclusive.

Upon recommendation of the School of Industrial Design, the notation "with Distinction" may be made on the academic records of a candidate for the degree of Bachelor of Industrial Design. To be considered for this recommendation, the candidate is expected to obtain a GPA of 9.0 or better in the course requirements of the final year and, in addition, a GPA of 6.6 or better in the course requirements of the First to Fourth years, inclusive.

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Industrial Design 85.100 ★

Introduction to Industrial Design

The theoretical background of industrial design: definitions of design and industrial design; its nature and its history; aspects of manufactured objects; design methods; design management in industry; professional practice and industrial design promotion, nationally and internationally. (Also listed as Architecture 76.206 ★.) Lectures three hours a week.

Industrial Design 85.101 ★

Industrial Design Analysis

Various aspects of industrial design practice, including: the principles of product analysis; the object/context relationship; the role of the manufactured object; and design analysis from the perspective of the user, the maker and the designer. (Also listed as Architecture 76.211 ★.)

Prerequisite: Industrial Design 85.100 ★ (Architecture 76.206 ★). Lectures three hours a week.

Industrial Design 85.130 ★

Projects IA

An introduction to the techniques of industrial design including drawing and sketching as an aid to design, basics of line and shape, ideation and visualization, product drawing, presentation techniques, laboratory equipment and practices, introduction to the design process.

Prerequisite: Industrial Design 85.100 ★ (may be taken concurrently).

Lectures and tutorials two hours a week, studio four hours a week.

Industrial Design 85.131 ★**Projects IB**

Further aspects of industrial design theory and practice, more specifically those dealing with principles of product development and fundamentals of form and colour; case studies. Emphasis is on creative problem-solving techniques and application of visual communication techniques in design; introduction to fundamentals of photography.

Prerequisite: Industrial Design 85.130 ★.

Lectures and tutorials two hours a week, studio four hours a week.

Industrial Design 85.211 ★**Mass Production Technology for Industrial Design A**

Transformation techniques applied to manufacturing materials. Part-design requirements and cost factors for manufacturing processes. Influences and role of assembly, finishing, production tooling, and costing.

Precludes additional credit for Industrial Design 85.210.

Prerequisites: Industrial Design 85.100 ★, 85.130 ★.

Lecture and tutorials three hours a week, laboratory three hours a week.

Industrial Design 85.212 ★**Mass Production Technology for Industrial Design B**

Continuation of Industrial Design 85.211 ★. Transformation techniques applied to manufacturing materials. Part-design requirements and cost factors for manufacturing processes. The influences and role of assembly, finishing, production tooling, costing are addressed.

Precludes additional credit for Industrial Design 85.210.

Prerequisite: Industrial Design 85.211 ★ or permission of the School.

Lecture and tutorials three hours a week, laboratory three hours a week.

Industrial Design 85.215 ★**Computer Applications for Industrial Design**

Provides industrial design students with a working knowledge of computers and their applications. Topics covered include computer fundamentals and the use of application packages in design. Sample applications may include text/word processors, graphics manipulation, authoring software, computer-aided design and 3-D modellers.

Precludes additional credit for Computer Science 95.104 ★.

Prerequisite: Industrial Design 85.131 ★.

Lecture and tutorials three hours a week.

Industrial Design 85.216 ★**Introduction to Multimedia**

Analogue and digital systems and graphic processes used in the making of images. Fundamentals of still photography and videography combined with current computer technologies in the application of visual communication techniques.

Lectures three hours a week, laboratory three hours a week.

Industrial Design 85.231**Projects IIA**

Introduction to the basic principles of design, incorporating fundamental aspects of design methodology. Topics include: typology of objects, colour specification, techniques for modelling, visual communication, problem-solving and relevant form and colour applications. The design project(s) will relate to principles covered in the lectures.

Prerequisites: Industrial Design 85.101 ★ and 85.131 ★; or permission of the School.

Lectures four hours a week, studio eight hours a week.

Industrial Design 85.232 ★**Projects IIB**

Introduction to the design principles associated with adapting products to an existing product semantic. Topics covered: principles of design, product semantics, design analysis, design synthesis, design evaluation, and modelling techniques. The design project(s)

explore some or all of the design principles covered in the lectures. Prerequisite: Industrial Design 85.231; or permission of the School. Lectures two hours a week, studio four hours a week.

Industrial Design 85.241 ★**Work Term 1**

Prerequisite: Registration in the Co-op program of the Bachelor of Industrial Design Program. Senate Curriculum Committee feels these courses should have some minimal course description, as is the practice in other co-op work term courses.

Industrial Design 85.260 ★**Ergonomics for Industrial Design**

This course focuses on physical, biomechanical, environmental and cognitive issues. Displays, controls, workstations, tools and software interfaces are examined from scientific and practical perspectives.

Precludes additional credit for Industrial Design 85.360 ★.

Prerequisite: Psychology 49.101 ★ and 49.102 ★ or 49.100.

Lectures and discussion three hours a week.

Industrial Design 85.312 ★**Graphics Technology and Design**

Techniques and processes used in printing and the relationship of these processes to graphic design. Typeface design and the development of type. Typefaces as exponents of cultural trends. Basic underlying typography and layout in graphic design. Minor graphic design projects.

Prerequisites: Industrial Design 85.231 and 85.232 ★.

Lectures and tutorials three hours a week.

Industrial Design 85.313 ★**Package Engineering and Design**

Processes and materials used in the packaging industry. Principles of package engineering and design for the transportation and distribution of mass-produced products. Product and brand identification; corporate identity through package design. Minor packaging design projects.

Prerequisites: Third-year registration and Industrial Design 85.312 ★.

Lecture and tutorials three hours a week.

Industrial Design 85.314 ★**Exhibition Design**

The field of exhibition design is explored through lectures and case studies. Students undertake a preliminary exercise in display and exhibition design prior to the development and implementation of an exhibition; this normally involves the design of the School of Industrial Design's Annual Graduation Exhibition.

Prerequisite: Industrial Design 85.231.

Lectures and tutorials three hours a week.

Industrial Design 85.321 ★**Product Communication and Evolution**

The mechanics of communication in general and of communication by means of objects in particular. Analyses of objects and environments with respect to communicative functions.

Prerequisite: Third-year registration or permission of the School.

Lecture and tutorials three hours a week.

Industrial Design 85.322 ★**Advanced Studies in Form and Colour**

Students may continue the research and study encountered in Industrial Design 85.231 and 85.232 ★ by doing advanced research in some specific area of the phenomena of form and/or colour. Directed study.

Prerequisites: Industrial Design 85.231 and 85.232 ★ or permission of the School.

Lecture and tutorials three hours a week.

Industrial Design 85.330**Projects IIIA**

This course is an introduction to the design principles associated

Industrial Design

with the evaluation and re-design of an existing product. Topics to be covered include: user/machine relationship, component packaging, and manufacturability. The design project(s) explore some or all of the design principles covered in the lectures.

Prerequisite: Industrial Design 85.232 ★ or permission of the School.

Lectures four hours a week, studio eight hours a week.

Industrial Design 85.331

Projects IIIB

This course is an introduction to the principles of innovation as found in industrial design. Topics to be covered include: invention, innovation, entrepreneurship, basic mechanisms. The design project(s) explore some or all of the design principles covered in the lectures.

Prerequisite: Industrial Design 85.330 or permission of the School.

Lectures four hours a week, studio eight hours a week.

Industrial Design 85.335 ★ and 85.336 ★

Third-Year Special Industrial Design Studies

Special Industrial Design Studies deal with specific projects, which may differ from year to year depending on the availability of specialists in a particular field or study opportunities as they present themselves.

Prerequisite: Third- or Fourth-year registration, or permission of the School.

Lectures, tutorials and laboratory six hours a week.

Industrial Design 85.342 ★

Work Term 2

Prerequisite: Registration in the Co-op option of the Bachelor of Industrial Design Program.

Industrial Design 85.343 ★

Work Term 3

Prerequisite: Registration in the Co-op option of the Bachelor of Industrial Design Program.

Industrial Design 85.344 ★

Work Term 4

Prerequisite: Registration in the Co-op option of the Bachelor of Industrial Design Program.

Industrial Design 85.345 ★

Work Term 5

Prerequisite: Registration in the Co-op option of the Bachelor of Industrial Design Program.

Industrial Design 85.351 ★

Fine Arts and Design

Cultural subjects from the fields of fine and performing arts. The context and relevance of industrial design as an integral part of our culture. Guest lecturers.

Precludes additional credit for Industrial Design 85.350.

Prerequisite: Industrial Design 85.100 ★ (Architecture 76.206 ★).

Lectures and tutorials three hours a week.

Industrial Design 85.352 ★

Contextual Nature of Products

Cultural subjects which have an influence on contemporary industrial design. The perspective of the course is anthropological: the context and cultural relevance of industrial design.

Precludes additional credit for Industrial Design 85.350.

Prerequisite: Industrial Design 85.100 ★ (Architecture 76.206 ★).

Lectures and tutorials three hours a week.

Industrial Design 85.361 ★

Industrial Design and the User

Design methodology and the value of scientific methods for data collection and decision making. Techniques such as interviewing, focus groups, usability testing, brainstorming, and value analysis will be covered.

Teamwork techniques and values are considered.

Prerequisite: Industrial Design 85.260 ★ (Architecture 76.206 ★).

Lectures three hours a week, laboratory three hours a week.

Industrial Design 85.400 ★

Professional Practice in Industrial Design

The organizational aspects of consultancies and client responsibilities within the framework of corporate management. Topics include: the form of contracts for consultancy, determination of fees, legal implications, patents and copyrights. Guest lecturers.

Prerequisite: Industrial Design 85.100 ★ (Architecture 76.206 ★).

Lectures and discussion three hours a week.

Industrial Design 85.401 ★

Industrial Design Seminar

Each year a special topic is chosen to be elaborated on and discussed. The topics deal with problems in the relationship of industrial design to other disciplines or problems regarding the theoretical aspects of industrial design itself.

Prerequisite: Registration in Fourth-year Industrial Design projects.

Seminar three hours a week.

Industrial Design 85.411 ★

Advanced Studies in Manufacturing Technology for Industrial Design

Directed study in the field of manufacturing, centred on such topics as: cost analysis, new materials and processes, computer aided manufacturing, numerically controlled machining, machining of moulds, etc.

Prerequisites: Industrial Design 85.211 ★ and 85.212 ★.

Industrial Design 85.420 ★

Form Organization

Using form organization as a tool to design, the definition and prescription of monolithic solids by means of an abstract system; making and verifying materialized approximations of such solids.

Prerequisites: Industrial Design 85.231 and 85.232 ★ or permission of the School.

Lectures, tutorials and laboratory six hours a week.

Industrial Design 85.430 (2.0 credits)

Major Project

Application of design principles in a comprehensive design project. Problem area chosen should be product oriented and of sufficient complexity. Normally undertaken in consultation with off-campus organizations and industry; supervised by faculty members.

Prerequisite: Industrial Design 85.331 or permission of the School.

Lectures and tutorials two hours a week, studio ten hours a week.

Industrial Design 85.431 ★

Minor Projects A

Enables students to demonstrate through a series of short projects their versatility in product design or in complementary design fields such as communication, graphic design or design experiments. Emphasis is on time management and the ability to work independently on assigned projects.

Precludes additional credit for Industrial Design 85.431.

Prerequisite: Industrial Design 85.331 or permission of the School.

Lectures and tutorials two hours a week, studio four hours a week.

Industrial Design 85.432 ★

Minor Projects B

The application of required skills and team work in a comprehensive design project. The subject matter deals with broad issues in design.

Precludes additional credit for Industrial Design 85.432.

Prerequisite: Industrial Design 85.331 or permission of the School.

Lectures and tutorials two hours a week, studio four hours a week.

Industrial Design 85.435 ★ and 85.436 ★

Fourth-Year Special Industrial Design Studies

Like the Third-year Special Industrial Design Studies, those of Fourth year deal with specific projects, which may differ each year

depending on the availability of specialists among the faculty of the School of Industrial Design or on particular opportunities as they present themselves.

Prerequisite: Fourth-year registration or permission of the School.
Lectures and tutorials two hours a week, studio four hours a week.

Industrial Design 85.440 ★

Industrial Practice Internship Field Reports

The relationship of technological phenomena to industrial design. Following the internship period (12 weeks), a comprehensive report describing observations and insights must be submitted.
Laboratory three hours a week.

Integrated Science Studies (Science)

3201 Herzberg Building
Telephone: 520-2600 ext. 1395
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Academic Administration

Chair, I. Munro

Members of the Committee, G. Carmody • B. Jarosz • J. Kelly
• B.R. Lifeso • I. Munro • S. Peck • I. Pressman • I. Reichstein • M.
Smith • D. Wigfield

General Information

The Integrated Science Studies (ISS) program offers undergraduate students in the Faculty of Science the opportunity to develop an individualized program that blends a concentration in Science with a linked area of specialization in another faculty. A student whose academic aspirations cannot be satisfied within the constraints of one of the many programs offered by the Faculty of Science may apply to the Integrated Science Studies program and describe the program that he or she would choose to pursue. If the proposal is intellectually coherent and satisfies the academic constraints of the Integrated Science Studies Program, the student will be admitted to ISS and will be permitted to follow the program that has been approved.

The program requires that a student select an area of concentration within Science: physical sciences, environmental sciences, life sciences, behavioral sciences, or mathematics and statistics, in order to acquire a depth of understanding of the particular discipline, its workings and its significance. In the associated specialty area outside of the Faculty of Science, a pattern of courses should be selected that provides the student with a concomitant, integrated understanding. Students are urged to be creative and bold in their planning, but should consult with the Chair of the ISS Program for advice or assistance before applying for admission to the Integrated Science Studies program. A detailed list of the proposed courses and a description of the overall program must be submitted by every ISS applicant beyond First year. First-year students must submit their planned program to the ISS Chair before they commence their Second year. The Committee monitors the progress of all ISS students.

An Honours program and a Major program are available for ISS students. Both require a course of Independent Study as an important part of the program (Integrated Science 64.498, 64.399★).

This program is suitable for part-time students and mature students. Students in ISS may be eligible to transfer into co-op or work-study programs sponsored by other Departments in the Faculty of Science, provided they meet all the prerequisites and grade requirements. ISS students are advised to familiarize themselves with the particular rules of the Faculty of Science that apply to them.

Many different specific program combinations have been adopted in the past. Possible combinations available within the program are included here as examples, others are possible.

- biology and psychology, e.g. neuroscience, nutrition plus behaviour;
- biotechnology and business, e.g. genetic engineering and management;
- chemistry/biochemistry and business, e.g. pre-pharmacy;

- ecology and management, e.g. resource management, conservation;
- environmental sciences (i.e. biology, chemistry, geography, earth sciences, physics, statistics), e.g. pollution, acid rain, climate studies, sustainable development;
- geography, sciences and anthropology, e.g. archeological sciences;
- life sciences (biology, chemistry, biochemistry) and social sciences, e.g. pre-medical studies, pre-dentistry;
- operations research/mathematics and business, e.g. management science;
- physical geography and civil engineering, e.g. soil sciences;
- physics and psychology, e.g. perception;
- physics and geography and computer science, e.g. remote sensing;
- psychology and computer science, e.g. artificial intelligence, user interfaces;
- science and engineering, e.g. bioengineering, instrumentation, ergonomics;
- science and journalism, e.g. science writing, editing, reporting;
- science and foreign languages/linguistics, e.g. translation, interpreting;
- statistics and economics and business and law, e.g. actuarial sciences.

Admission Requirements

Application for admission to the program is made on an application form available from the Registrarial Services office. The admission requirements for these programs are those specified for the B.Sc. Honours and Major degrees. (See p. 109.) Before seeking formal admission to the program, students are advised to consult with the Chair for assistance in formulating an application proposal and a coherent set of courses that will meet the objectives of the student and fulfill Calendar requirements.

Course Requirements

First Year

The First-year program consists of 5.0 credits approved for a First-year Science program including:

- (a) Mathematics 69.107★ and 69.117★;
- (b) 2.0 experimental Science credits chosen from two of Biology, Chemistry, Geology, Physics;
- (c) 2.0 additional credits chosen from Science, Mathematics, Arts, Social Sciences, Computer Science (except Computer Science 95.100★ or 95.101★) or Engineering.

In establishing their First-year program, students should consult with the Chair of the Integrated Science Studies to ensure that they register for appropriate courses.

Honours Program

The program, under the direction of the Integrated Science Studies Committee, consists of 20.0 credits, 15.0 beyond First year including:

1. 9.0 credits selected from the Faculty of Science above the 100-level, including Integrated Science 64.498; 4.0 of the Science credits must be at the 300- or 400-level; the foregoing courses are designated as the Science sequence;
2. 4.0 credits in an inter-related specialized area selected from outside the Faculty of Science; these credits are designated as the Non-Science sequence.

At least 2.0 credits must also be chosen from the Faculties of Arts or Social Sciences.

At least 13.0 credits must be at the 200- or higher level. In this program, all Technology, Society, Environment Studies courses are considered Non-Science credits.

Major Program

Although programs are planned and approved on an individual basis, the general framework of regulations is specified. The program, under the direction of the Integrated Science Studies Committee, consists of 15.0 credits, 10.0 beyond First year including:

1. 6.0 credits selected from the Faculty of Science above the 100-level, including Integrated Science 64.399 ★; 2.0 of the Science credits must be at the 300- or 400-level; the foregoing credits are designated as the Science sequence;
2. 3.0 credits in an inter-related specialized area selected from outside the Faculty of Science; these credits are designated as the non-Science sequence.

At least 2.0 credits must also be chosen from the Faculties of Arts or Social Sciences.

At least 8.0 credits must also be at the 200-level or higher. In this program, all Technology, Society, Environment Studies courses are considered Non-Science credits.

Graduation

In order to graduate, students must fulfill all University graduation regulations (see p. 48) and all Faculty regulations (see p. 109), in addition to the Committee regulations and requirements.

Honours Program

To qualify for graduation a student must satisfy the normal requirements of the Faculty and have GPAs of 6.5 or better in both the Science sequence (9.0 credits) and the Non-Science sequence (4.0 credits) as well as an overall GPA of 5.0 or better (20.0 credits). The class of Honours degree will be determined following general Faculty regulations using all 13.0 credits in the Science and Non-Science sequences to calculate the Honours GPA.

Major Program

To qualify for graduation a student must satisfy the normal requirements of the Faculty and have GPAs of 4.0 or better in the Science sequence (6.0 credits), the Non-Science sequence (3.0 credits), and overall (15.0 credits). The last 5.0 credits taken normally will include at least 1.0 credit from each of the Science and Non-Science sequences.

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Integrated Science 64.399 ★

Independent Study

The student integrates aspects of both the science and the non-science areas of study in a project supervised by a faculty member. Prior to or immediately upon registration, the student should consult with the ISS Chair for topic approval and course regulations. Precludes additional credit for Science 60.399 ★

Prerequisites or co-requisite: At least 0.5 credits at the 300-level or better and permission of the ISS Chair.

Integrated Science 64.498

Honours Project

Under the supervision of a faculty advisor, the student carries out a research project in the ISS areas of study. Prior to or immediately upon registration, the student should consult with the ISS Chair for topic approval and course regulations.

Precludes additional credit for Science 60.498.

Prerequisite: Permission on the ISS Chair.

Interdisciplinary Studies (Arts and Social Sciences)

2216 Dunton Tower
Telephone: 520-2368
Fax: 520-3985

Academic Administration

Director, J. A. Brook

Associate Director, Charles Gordon

Program Co-ordinators, *Child Studies*, Tina Daniels • *Cognitive Science*, Ann Laubstein • *Directed Interdisciplinary Studies*, Charles Gordon

Programs of Study

The Institute of Interdisciplinary Studies is the administrative centre for interdisciplinary programs in the Faculty of Arts and Social Sciences and the Faculty of Public Affairs and Management that do not have another home. The Institute offers B.A. (Honours) and B.A. programs in Child Studies (see p. 179), and Directed Interdisciplinary Studies (see p. 207), and an Honours program in Cognitive Science (see p. 190).

The degree of Bachelor of Arts in Interdisciplinary Studies is pursued by means of a plan of study proposed by the student. Lists of courses from which proposals may be drawn are provided in the following areas: Aboriginal Studies, African Studies, Asian Studies, Labour Studies, Latin American and Caribbean Studies, Medieval Studies, United States Studies and Urban Studies. (For Visual and Performing Arts, see the listings for the School for Studies in Art and Culture, p. 130, for Technology, Society, Environment Studies, see p. 463). The student may propose a plan of study in an area of special interest to them that they define themselves.

In addition, the Institute offers four kinds of interdisciplinary courses: Humanities (course prefix 02), Social Science (course prefix 03) and combined Humanities/Social Science (course prefix 04 and 07). These courses are listed below.

Requirement for Breadth, for students in B.A. or B.A.(Honours) degrees

Category for Breadth	Courses in this unit
The temporal dimension of human societies, analyzing times before the present era or societies other than our own	07.201 ★
The artifacts of the imagination in literature and/or other forms, or that addresses the life of the imagination and culture.	04.390, 391 ★
The understanding of social, technological and/or natural processes and the ways in which that understanding is obtained in science and social science.	All IIS courses not listed in any other category
Matters of human values, ethics and social responsibilities	03.101, 60.202 ★

Interdisciplinary Courses

The subject areas and specific courses listed here include:

- (a) courses supervised and/or administered by the Institute of Interdisciplinary Studies;
- (b) courses supervised and/or administered by one of the four undergraduate faculties, but which are available as important areas of concentration to students registered in programs offered by other faculties;
- (c) courses offered by members of more than one discipline or faculty available to all students (subject to restrictions outlined within the course descriptions themselves and the regulations of the faculty in which the student is registered);

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Arts

Arts 02.150

Arts Seminar

An intensive introduction to close analytical reading, reasoned writing, and the study of text in context. The background for the seminar will be provided by the lectures for Philosophy 32.150D. Readings, somewhat more complex than those in Philosophy 32.150D, follow the same sequence of topics discussed in that course. However, students in Arts 02.150 will be asked to take on further assignments including a major research project in second term.

Open only to First-year students who are also registered in Philosophy 32.150D.

Prerequisite: Permission of the Department of Philosophy is required.

Seminar three hours a week.

Arts and Social Sciences

Cognitive Science 07.201 ★

History of Cognitive Science

A survey of the history and development of cognitive science as a separate branch of knowledge, from its roots in cybernetics and theory of computation in the late 1940's to the large multi-disciplinary, multi-national teaching and research program it has now become.

Prerequisite: Second-year standing or permission of the Institute. Seminar three hours a week.

Interdisciplinary 04.251 ★

Issues in Child Studies

This course takes an interdisciplinary approach to Child Studies, introducing students to the perspectives and methods of study employed by various disciplines, including psychology and sociol-

ogy. Issues related to research ethics will be introduced.
Prerequisite: Psychology 49.100 and permission of the Institute.
Lecture and discussion groups, three hours a week.

Cognitive Science 07.301 ★

Elements of Cognitive Science

Selected topics in cognitive science covered from the perspectives of psychology, computer science, linguistics, philosophy and other related disciplines.

Precludes additional credit for Cognitive Science 04.101 ★.

Lectures three hours a week.

Arts and Social Sciences 04.390

The Literature of Existentialism

A study of the origins, development, and principal characteristics of existentialist literature. (Also listed as English 18.390.)

All assigned readings will be in English.

Prerequisite: Third-year standing.

Interdisciplinary 04.391 ★

Themes in Interdisciplinary Inquiry

The course will examine topics chosen by the interdisciplinary faculty, along with various methods of inquiry and styles of thought that may be brought to bear upon them. Student reading and research will compare, contrast and synthesize various perspectives.

Prerequisite: Third-year standing in Directed Interdisciplinary Studies, or permission of the Institute.

Seminar three hours a week.

Interdisciplinary 04.441 ★

A Seminar in United States Studies

A required course for students in United States Studies area in Directed Interdisciplinary Studies designed to allow discussion and research on topics of an interdisciplinary nature.

Interdisciplinary Studies 04.495 ★

Directed Interdisciplinary Studies Fieldwork I

Fieldwork related to the theme of a Directed Interdisciplinary Studies program. A proposal with a fieldwork research question and a supervisor must be approved prior to registration. A paper relating the fieldwork to the student's DIS program must be submitted. Graded as Sat/Uns.

Prerequisite: Fourth-year Honours standing in Directed Interdisciplinary Studies or permission of the Institute.

Interdisciplinary Studies 04.496 ★

Directed Interdisciplinary Studies Fieldwork II

Fieldwork related to the theme of a Directed Interdisciplinary Studies program. A proposal with a fieldwork research question and a supervisor must be approved prior to registration. A paper relating the fieldwork to the student's DIS program must be submitted. Graded as Sat/Uns.

Prerequisite: Fourth-year Honours standing in Directed Interdisciplinary Studies or permission of the Institute.

Interdisciplinary 04.498

Honours Project

Interdisciplinary research project for Honours students in the Fourth year of all IIS programs except Cognitive Science. In selecting a project, students must consult their Program Coordinator. Only the Program Coordinator can assign a supervisor or grant approval to register in this course. Faculty regulations governing Honours Research Essays and Honours Theses apply (see p. 67).

Registration in this course is limited to students eligible for Fourth-year standing in the B.A. Honours program in IIS.

Science

(for further information contact the office of the Dean of Science, 520-4388)

Science 60.101 ★

Introduction to the Environment

The nature of the biosphere: scientific bases of important environmental issues; evolution of life; properties and dynamics of populations and ecosystems; biodiversity; introduction to identification skills; sustainability of renewable resources, including food.

Not acceptable for credit in a Science program.

Precludes additional credit for Science 60.100.

Prerequisite: A knowledge of Grade 10 advanced level Mathematics will be assumed.

Lectures/demonstrations three hours a week and project assignments.

Science 60.102 ★

The Laws of Nature

Fundamental ideas and concepts of science; origins and expressions of these in the ecosphere; types of forces; radiation; energy transfers and transitions; properties of atoms and molecules; chemistry in the environment.

Not acceptable for credit in a Science program.

Precludes additional credit for Science 60.100.

Prerequisite: Science 60.101 ★ or permission.

Lecture/demonstrations three hours and project assignments.

Science 60.201 ★

The Earth

Early earth history; tectonic cycles; mineral resources of the earth's surface; the oceans; biogeochemical cycles; natural hazards.

Not acceptable for credit in a Science program.

Precludes additional credit for Science 60.200.

Prerequisite: Science 60.102 ★ or equivalent.

Lectures/demonstrations three hours a week and project assignments.

Science 60.202 ★

Human Impacts on the Environment

Air and water pollution; global climatic change; waste management; industrial chemicals; sources and uses of energy; nuclear energy and radiation; risk assessment of technological hazards.

Acceptable only as a free elective in a Science program.

Precludes additional credit for Science 60.200.

Prerequisite: Science 60.201 ★ or two experimental science OACs or one First year university experimental science course.

Lectures/demonstrations three hours a week and project assignments.

Social Sciences

First-Year Seminar in Human Rights 01.114

Human Rights: Issues and Investigations

Arguments that have been used to defend differing positions on rights issues, past and present. The validity of contending arguments; social factors influencing wide-spread acceptance of particular views. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminar three hours a week.

First-Year Seminar in Interdisciplinary Studies 01.115

Reading the Web

Academic writing and study skills through examination of the literacy and social interaction required for various media. Reading and writing on and for the Web and other forms of computer-mediated communications and cooperative work compared with writing for academic purposes. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminar three hours a week.

First-Year Seminar in Social Sciences 01.144

Introduction to Social Sciences

Introduction to the disciplines comprising the social sciences. Topics include: social sciences and the University, the social scientist in the community, research methods and practice, interdisciplinary approaches to social problems, and information technology in the social sciences. Writing process, problem-solving and critical thinking skills are emphasized. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Lectures two hours a week, workshops two hours a week.

Social Sciences 03.101

Human Rights and the Social Sciences

Human rights from an interdisciplinary perspective. Topics include the foundations and nature of rights; roots of inequality and oppression; aboriginal rights; racism; women and rights; sexual orientation; state and corporate power; economic exploitation; the environment and rights; warfare; torture; and social movements. (Also listed as Sociology/Anthropology 56.101)

Lectures three hours a week.

Social Sciences 03.300 ★

Computer Applications in the Social Sciences

An introduction to the use of mainframe and micro-computer applications in social science research. Topics covered may include statistical packages, database management, word processing, graphics, computer communications, spread sheets, computer data collection and laboratory control.

Prerequisites: Computer Science 95.101 ★, or any programming course, and a research-methods course.

Social Sciences 03.401 ★

Innovations in Social-Science Data Collection and Measurement

This course provides an opportunity to study recent innovations in social-science data collection and measurement. It is an interdisciplinary course of interest to senior students, researchers and practitioners who already have a preliminary foundation in social science methods. Topics emphasized vary from year to year, but developments in sampling theory, survey instrument design, and reduction of measurement bias are examples of intended topics.

Prerequisite: One full credit in methodology in one of the social sciences, or permission of the program co-ordinator.

Social Sciences 03.402 ★

Innovations in Quantitative Analysis for the Social Sciences

This course provides an opportunity to study recent innovations in quantitative analysis of social science data. It is an interdisciplinary course of interest to senior students, researchers and practitioners who already have a preliminary foundation in quantitative analysis for the social sciences. Topics emphasized vary from year to year, but linear restriction modeling, log-linear techniques and developments in time series analysis are examples of intended topics.

Prerequisite: One full credit in methodology in one of the social sciences, or permission of the program co-ordinator.

Social Sciences 03.410 ★

Seminar on Special Research Problems in Social Sciences

This is a research-oriented honours seminar that focuses on special problems in the Social Sciences.

Prerequisite: Fourth-year honours in a social sciences discipline or permission of the program co-ordinator.

International Affairs

(Public Affairs and Management)

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

International Affairs 46.300

Policy in a Global Context

Analysis of international policy processes relevant to governments, nongovernmental organizations, international organizations and multinational corporations, drawing upon theories of international relations, Political science, law and economics. Emphasis is placed on analytical and normative aspects of public policy processes in international relations

Prerequisites: Third-year standing in the B.P.A.P.M. program and registration in the International Studies Specialization; or permission of the Norman Paterson School of International Affairs.

Lectures or seminars three hours a week.

International Affairs 46.411 ★

Special Topics in Conflict Analysis and International Affairs

An examination of selected issues in conflict analysis from an interdisciplinary perspective

Prerequisites: Fourth-year standing in the B.P.A.P.M. program and registration in the International Studies Specialization; or permission of the Norman Paterson School of International Affairs.

Lectures or seminars three hours a week.

International Affairs 46.412 ★

Special Topics in Development and International Affairs

Analysis of selected issues in international aspects of development from an interdisciplinary perspective.

Prerequisites: Economics 43.363 and Fourth-year standing in the B.P.A.P.M. program and registration in either the International Studies Specialization or the Development Studies Specialization; or permission of the Norman Paterson School of International Affairs.

Lectures or seminars three hours a week.

International Affairs 46.413 ★

Special Topics in International Political Economy and International Affairs

Analysis of issues in international political economy from an interdisciplinary perspective.

Prerequisites: Fourth-year standing in the B.P.A.P.M. program and registration in the International Studies Specialization; or permission of the Norman Paterson School of International Affairs.

Lectures or seminars three hours a week.

International Affairs 46.422 ★

Issues in Development Management

An examination of the application of organization theory to policy implementation and evaluation for developing and transitional systems, with an emphasis on the role of cultural differences and divergent value systems in development management. (Also listed as Political Science 47.449 ★)

Prerequisites: Economics 43.363 ★ and Fourth-year standing in the B.P.A.P.M. program and registration in either the International Studies Specialization or the Development Studies Specialization.

Lectures or seminars three hours a week.

School of Languages, Literatures and Comparative Literary Studies

Italian

(Arts and Social Sciences)

1416 Dunton Tower
Telephone: 520-5644
Fax: 520-2564

Teaching Staff

Professor

Francesco G. Loriggio, B.A.(British Columbia), M.A., Ph.D.(California at Los Angeles)

Associate Professor

William Anselmi, B.A., M.A.(Carleton), Ph.D.(Montréal)

Assistant Professor

G. Panico, B.A.(M. Pagano), M.A., Ph.D.(Ottawa)

General Information

Students currently enrolled in degree programs offered by the Discipline of Italian are governed by the requirements contained in the 1997-98 Undergraduate Calendar.

Minor in Italian

A Minor in Italian requires 4.0 credits in Italian, with a GPA of 4.0 or better, as follows:

1. 26.100 or 26.110 or 26.170
2. 26.200 or 26.210
3. 26.300
4. 1.0 credit from the following: 26.250, 26.262, 26.360.

At least 2.0 credits in the Minor must be completed at Carleton.

Requirement for Breadth, for students in B.A. or B.A.(Honours) degrees

Category for Breadth	Courses in this unit
The temporal dimension of human societies, analyzing times before the present era or societies other than our own	
The artifacts of the imagination in literature and/or other forms, or that addresses the life of the imagination and culture.	All Italian Courses
The understanding of social, technological and/or natural processes and the ways in which that understanding is obtained in science and social science.	
Matters of human values, ethics and social responsibilities	

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Italian Language Acquisition Courses

Students must read and follow the Guidelines for Choosing Italian Language Courses, included in the *Registration Instructions and Class Schedule* booklet.

Before selecting a language acquisition course, students should note that there are three levels in language courses and the following sequence applies:

Level 1

Italian 26.100 or 26.110 or 26.170

Level 2

Italian 26.200 or 26.210

Level 3

Italian 26.300

Students cannot go backwards in the sequence of level.

University of Ottawa-Carleton University Collaboration

The language acquisition courses Italian 26.100, 26.170, 26.200 and 26.300 are offered each year at both Carleton and the University of Ottawa. The other courses alternate each year between the two universities.

University of Ottawa course numbers corresponding to Carleton numbers are listed in parentheses.

Italian 26.100

Introductory Italian

A course designed to introduce the student to the acquisition of Italian. Understanding, speaking, reading and writing. Precludes additional credit for Italian 26.110, 26.170, 26.180, and 26.101★/26.102★.

Lectures and language practice three hours a week and one hour practice in the laboratory.

Italian 26.110

Intensive Italian I

Intensive course designed to accelerate the acquisition of Italian. Intended for students with no previous knowledge of Italian who wish to obtain in one term the linguistic competence usually acquired in one year.

Precludes additional credit for Italian 26.100, 26.170, 26.180 and 26.101★/26.102★.

Lectures six hours a week.

Italian 26.150

The Italian Tradition in Literature

Selected readings (in translation) of some of the major figures of Italian literature as Dante, Boccaccio, Petrarca, Machiavelli, Goldoni, Leopardi, Manzoni, Verga, D'Annunzio, Pirandello, Svevo, Moravia, Pasolini, Calvino, Fo.

Lectures three hours a week.

Italian 26.160 (2105/2106; F2505/2506)

Introduction to Italian Culture

Major phases of Italian social and intellectual history. Literary as well as non-literary texts will be read in translation. Language of instruction: English.

Precludes additional credit for Italian 26.260.

Lectures three hours a week.

Italian 26.170

Italian for Italophones

Designed to meet the needs of students of Italian origin and/or speakers of a community language or a dialect, wishing to retrieve standard Italian or to add standard Italian to their linguistic repertoire.

Precludes additional credit for Italian 26.100, 26.101 ★, 26.102 ★, 26.110, and 26.180.

Prerequisite: Some knowledge of an Italian dialect or of a community language.

Lectures and language practice three hours a week and one hour practice in the laboratory.

Italian 26.200

Intermediate Italian

A sequel to Introductory Italian. speaking, reading, writing, understanding, and using the language as a means for self-expression. A course intended to lead to the comprehension and enjoyment of Italian texts.

Precludes additional credit for Italian 26.180 and 26.210.

Prerequisites: Italian 26.100 or 26.110 or 26.170 or 26.101 ★ and 26.102 ★ or permission of the School.

Lectures and language practice three hours a week and one hour practice in the laboratory.

Italian 26.210

Intensive Italian II

Intended for students who wish to take the sequel to Italian 26.110. It provides students with the linguistic competence usually acquired in the second year.

Precludes additional credit for Italian 26.180 and 26.200.

Prerequisites: Italian 26.100 or 26.110 or 26.170.

Lectures six hours a week.

Italian 26.250 (2927/2928)

Introduction to the Study of Italian Literature

Discussion of basic concepts of literary criticism in relation to representative texts from Italian literature.

Precludes additional credit for Italian 26.240.

Prerequisite: Italian 26.180, 26.200 or 26.210; or permission of the School.

Lectures three hours a week.

Italian 26.262 (2129/2130; F2529/2530)

The Italian Heritage in North America

Survey of the Italian-Canadian and Italian-American contribution to Canadian and American culture. Texts will be read in English. The Language of instruction is English at Carleton and English or French at the University of Ottawa.

Precludes additional credit for Italian 26.362.

Lectures three hours a week.

Italian 26.300 (3911/3912)

Advanced Italian

A sequel to Intermediate Italian. Defined points of grammar, style, composition; conversation and translation. Designed to perfect the command of Italian.

Prerequisite: Italian 26.180, 26.200 or 26.210; or permission of the School.

Lectures and language practice three hours a week and one hour practice in the laboratory.

Italian 26.351 ★ (3952)

Italian Literature: Periods and Movements (1250-1650)

Focus on the formation of literary periods, the development of movements and other normative aspects of literary history.

Precludes additional credit for Italian 26.350.

Prerequisite: Italian 26.250.

Lectures three hours a week.

Italian 26.353 ★ (3953)

Italian Literature: Periods and Movements (1650-1990)

Focus on canon formation, the development of movements and other normative aspects of literary history.

Precludes additional credit for Italian 26.352.

Prerequisite: Italian 26.250.

Lectures three hours a week.

Italian 26.356 ★ (3956)

Themes in Italian Literature I (1250-1650)

Specific themes and issues pertaining to a particular period, genre or movement. The topic for 1999-2000 is: Dal menestrello all'istrione. Il teatro italiano dal 1250 al 1650.

Precludes additional credit for Italian 26.354.

Prerequisite: Italian 26.250.

Lectures three hours a week.

Italian 26.357 ★ (3957)

Themes in Italian Literature II (1650-1990)

Specific themes and issues pertaining to a particular period, genre or movement. The topic for 1999-2000 is: Dall'istrione al menestrello. Il teatro italiano dal 1650 al 1980.

Precludes additional credit for Italian 26.354.

Prerequisite: Italian 26.250.

Lectures three hours a week.

Italian 26.360 (3958/3959)

Themes and Issues in Italian Culture

The course examines issues concerning the development of Italian culture from the Thirteenth century to the Twentieth century. Topics may vary from year to year. The topic for 1999-2000 is: Incomunicabilità e alienazione nella cultura Italiana moderna.

Prerequisites: Italian 26.180, 26.200 or 26.210; or permission of the School.

Lectures three hours a week.

Italian 26.401 ★

The History of the Italian Language from 1860 to the Present

Issues pertaining to the development of the Italian language from 1860 to the present.

Precludes additional credit for Italian 26.400.

Prerequisite: Italian 26.300 or permission of the School.

Lectures three hours a week.

Italian 26.402 ★

Translation

The general principles as well as the particular problems of translation from and into Italian.

Precludes additional credit for Italian 26.480.

Prerequisite: Italian 26.300 or permission of the School.

Lectures three hours a week.

Italian

Italian 26.450 (4905/4906)

Italian Literature: Special Topics

A study of an Italian author, movement or theme.

Prerequisite: A 300-level literature course or permission of the School.

Lectures three hours a week.

Italian 26.460 (4903/4904)

Italian Culture: Interdisciplinary Perspectives

This course will study periods or aspects of Italian culture from the point of view of the relation between literature and the other arts or disciplines.

Prerequisite: Italian 26.360 or permission of the School.

Lectures three hours a week.

Italian 26.470

Topics in Italian Studies

Students of Italian wishing to focus on a particular aspect of Italian culture, language or literature.

Prerequisites: Italian 26.250, 26.300 and 26.360.

Seminar three hours a week.

Italian 26.490 (4929/4930)

Directed Studies

Individual tutorial on a selected topic chosen by the student in consultation with the Italian Section.

Prerequisite: GPA of 9.0 or better in Italian and permission of the School.

Journalism and Communication (Public Affairs and Management)

346 St. Patrick's Building
Telephone: 520-7404
Fax: 520-6690

Academic Administration

Director, Christopher Dornan
Supervisor of Graduate Studies, Journalism,
Catherine McKercher

Associate Director (Mass Communication), Paul Attallah
Supervisor of Undergraduate Studies, Journalism,
Klaus Pohle

Teaching Staff

Professors

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Associate Professors

Elly Alboim, B.A. (McGill), M.Sc. (Columbia) • **Paul Attallah**, B.A. (Ottawa), M.A., Ph.D. (McGill) • **Roger Bird**, B.A. (Carleton), M.A., Ph.D. (Minnesota) • **Michael Dorland**, B.A., M.A. (McGill), Ph.D. (Concordia) • **Christopher T. Dornan**, B.J. (Carleton), M.A. (Cambridge), Ph.D. (McGill) • **Ross A. Eaman**, B.A. (Carleton), M.A. (Toronto), Ph.D. (Queen's) • **Barbara Freeman**, B.J., M.A. (Carleton), Ph.D. (Concordia) • **Alan Frizzell**, B.A. (Strathclyde), M.A. (Queen's) • **Peter Johansen**, B.A. (Carleton), M.A. (Stanford) • **Lionel Lumb** • **Patrick MacFadden**, B.A. (McGill), M.A. (Columbia) • **Mary McGuire**, B.J. (Carleton) • **Catherine McKercher**, B.A. (Carleton), M.J. (Temple) • **Klaus Pohle**, M.J. (Carleton) • **Daniel B. Pottier**, B.J., M.A. (Carleton) • **Robert Rupert**, M.A. (Maryland) • **Eileen M. Saunders**, B.A. (St. Francis Xavier), M.A. (Queen's), Ph.D. (Carleton)

Assistant Professors

Karim Karim, B.A. (Columbia), M.A., Ph.D. (McGill) • **Janice Neil**, B.J. (Carleton) • **David Tait**, B.J., M.J. (Carleton) • **Dwayne Winseck**, B.A., M.A. (Windsor), Ph.D. (Oregon)

Adjunct Research Professors

Robert E. Babe • **P. Calamai** • **A.J. Cordell** • **C. Sanger** • **J. Sawatsky**

Adjunct Professor

J. Cameron Graham

General Information

Honours Program in Journalism

The School of Journalism and Communication offers three undergraduate degree programs in Journalism. These are the: Bachelor of Journalism with Honours, Bachelor of Journalism (Combined Honours) and Bachelor of Arts (Combined Honours). All three programs are designed to provide a thorough education in journalism based on three components: professional courses designed to instill and assess the skills of journalism; academic courses to guide inquiry into the nature and conduct of the news media; and University education in disciplines outside the School.

Students will be trained in the skills of gathering, assessing and presenting information in various media. They will also be educated so as to be able to make informed and considered judgments, both about news media practices and about the subject on which they bring their journalistic attentions to bear. Advantage is taken of the many resources outside the University provided by Carleton's location in the national capital.

Students who already hold an undergraduate degree in another field are not eligible to apply for the B.J. (Hons.) program. These students should consult the information on the Master of Journalism or the Master of Arts in Communication in the Faculty of Graduate Studies and Research Calendar.

Bachelor of Arts in Mass Communication

The School of Journalism and Communication offers B.A. (Honours) and B.A. undergraduate programs in Mass Communication.

Graduate Programs

The School of Journalism and Communication offers the Master of Journalism degree, a Master of Arts in Communication and a Ph.D. in Communication. For further details consult the Faculty of Graduate Studies and Research Calendar.

Program Requirements in Journalism

Program Requirements, Bachelor of Journalism with Honours

Candidates admitted to First Year of the B.J. program in 1995-96 or later take a total of 20.0 credits, normally in this sequence:

First Year

Journalism 28.100;
4.0 approved optional credits

Second Year

Journalism 28.221, 28.225 ★, 28.251 ★
3.0 approved optional credits

Third Year

Journalism 28.325, 28.326
3.0 approved optional credits

Fourth Year

28.400; 28.421; two of 28.425 ★, 28.426 ★, 28.427 ★ and 28.428 ★.
2.0 approved optional credits

Note: No more than two of 28.425 ★, 28.426 ★, 28.427 ★ and 28.428 ★ may be taken and cannot be taken simultaneously. No course may be taken more than once.

Prior to graduation, as part of their optional courses, students must complete a French language credit. Acceptable 100-level French courses are any of 20.107, 20.145, 20.160, or another French language credit approved by the School.

Those who already have capacity in French may fulfill this requirement by passing a language test administered on an ad hoc basis by the School of Journalism, but will be required to take an approved optional credit. Students who have completed French Immersion in High School, or who have obtained a Bilingual Diploma or Certificate will be regarded as having met this French language requirement, but will be required to take an approved optional credit.

Students from abroad whose mother tongue is other than English, or students whose research interests require another language, may obtain permission from the Supervisor of Undergraduate Studies to substitute this language for French.

In addition, before graduation students must take 1.0 approved credit in Canadian history, normally History 24.130, 24.233, 24.234 or 24.235. Students who expect to practice journalism in another country may be advised to choose a different history course and must seek written permission to do so from the Supervisor of Undergraduate Studies (Journalism).

Finally, students should be aware of the School's requirement that, before graduation, 5.0 credits must be taken in a field other than Journalism, with at least 1.0 of these credits at the 300-level or higher.

Program Requirements, Bachelor of Journalism (Combined Honours)

Honours programs may be taken by students in the four-year undergraduate program in which Journalism is combined with other disciplines. Such programs are available with the following subjects: Economics, English, French, History, Mass Communication, Political Science, Law, Philosophy, Sociology and Women's Studies. Details of the specific requirements for those programs may be obtained from the Department concerned. Special arrangements may be made for other combinations in consultation with the Supervisor of Undergraduate Studies (Journalism). The Journalism requirements for the Combined Honours program are normally the same as those for the Bachelor of Journalism with Honours listed above. With the exception of Philosophy (see below), the requirements of the other discipline are the same as those listed for the Combined Honours program in that discipline. Students are advised to consult the Combined Honours entry of their second discipline in this calendar for details. Combined Honours programs in Journalism and other disciplines are available only to students registered in Journalism.

Program Requirements, Bachelor of Arts (Combined Honours)

Upon application procedures described below, students combining Journalism with another discipline may elect to graduate with the degree Bachelor of Arts (Combined Honours) in lieu of the Bachelor of Journalism (Combined Honours). The Journalism requirements for this degree are the same as those for the Bachelor of Journalism with Honours listed above. With the exception of Philosophy (see below), the requirements of the other discipline are the same as those listed for Combined Honours programs in the other discipline. Students are advised to consult the Combined Honours entry of their second discipline in this calendar for details. All students who elect to receive the Bachelor of Arts (Combined Honours) must (i) write the Honours Research Essay, if required, in the other discipline and (ii) must transfer to the Bachelor of Arts Honours program as a Combined Honours student. Students who are not required to present an Honours Research Essay by the other discipline, but who nevertheless prefer to graduate as a Bachelor of Arts student, must also transfer to the Bachelor of

Arts Honours program. Such students must request an Internal Degree Transfer at least 60 days before the completion of the final courses required for their degree to assure their graduation at the next convocation.

Combined Honours programs in Journalism and other disciplines are available only to students registered in Journalism.

Combined Honours, Journalism and Philosophy

Course requirements are:

1. Journalism 28.100, 28.221, 28.225 ★, 28.251 ★, 28.325, 28.326, 28.400, 28.421, and two of 28.425 ★, 28.426 ★, 28.427 ★, 28.428 ★;
2. 7.0 credits in Philosophy including:
 - (i) An introductory course or equivalent
 - (ii) 6.0 credits beyond the 100 level including:
 - (a) 2.0 credits in History of Philosophy
 - (b) 32.280 (=32.254 ★ + 32.354 ★) or 32.290
 - (c) 1.0 credit at the 400-level
3. 1.0 French language credit; acceptable 100-level French courses are any of 20.107, 20.145, 20.160 or another French language credit approved by the School;
4. 1.0 approved credit in Canadian history. (Students who plan to practice journalism in another country may be advised to choose a different History course and must seek permission to do so from the Supervisor of Undergraduate Studies, Journalism.)
5. Approved options to make up a program of 20.0 credits.

B.J. Honours with a Concentration in Psychology

Note: The following course pattern does not constitute a Combined Honours program in Journalism and Psychology.

Course requirements are:

1. Journalism 28.100, 28.221, 28.225 ★, 28.251 ★, 28.325, 28.326, 28.400, 28.421 and two of 28.425 ★, 28.426 ★, 28.427 ★ and 28.428 ★;
2. Psychology 49.101 ★ and 49.102 ★, 49.200, two of 49.210 ★, 49.220 ★, 49.230 ★, 49.250 ★, 49.260 ★, 49.270 ★; 2.0 credits in Psychology chosen in consultation with members of the Department from Psychology courses in the areas of behavioral neuroscience, community and social psychology, perception and cognition, developmental psychology, or personality and assessment; and 1.0 optional credit in Psychology.
3. 1.0 French language credit; acceptable 100-level French courses are any of 20.107, 20.145, 20.160, or another French language credit approved by the School;
4. 1.0 approved credit in Canadian history. (Students who expect to practice journalism in another country may be advised to choose a different history course and must seek permission to do so from the Supervisor of Undergraduate Studies, Journalism.)
5. Approved options to make up a program total of 20.0 credits.

Admission, Continuation, and Graduation

Admission and Continuation

For admission to the First year, students are required to present:

The OSSD, or the equivalent, including six OACs with an average of 65 percent or better; or the successful completion of Qualifying-University year.

Although not required for admission, an OAC in English is recommended.

It should be noted that the number of student spaces in the School is limited. Because of this it may not be possible to grant admission to all applicants who meet the foregoing requirements. Admission will therefore be on a selective basis with preference given to those candidates who show the highest promise of success in the course.

Admission to Second year will be guaranteed only to First-year Journalism students who achieve a B+ or better in Journalism 28.100 and a CI of 8.00 in First year on 5.0 full credits. For information on calculation of the CI, refer to p. 72.

The School also maintains a number of places in Second year for students who wish to transfer from Carleton or elsewhere. Normally, offers are made to students with an overall GPA equivalent to A- or better.

Students may not continue into 300-level or higher courses without satisfactory standing.

Admission to these courses will be based on a minimum of:

- (a) C standing in Journalism 28.221;
- (b) an average of C+ in the four Journalism courses taken for credit in the first two years: Journalism 28.100, 28.221, 28.225 ★ and 28.251 ★;
- (c) an overall GPA of 4.0.

Note: Journalism students must become reasonably proficient in computer keyboarding as soon as possible. Most assignments in the professional Journalism courses are done by computer.

Graduation Requirements

In order to graduate, students must fulfill all University regulations (see p. 48) and all Faculty regulations (see p. 74), in addition to all School regulations.

In addition to the graduation requirements of the Faculty, a candidate for the degree of Bachelor of Journalism with Honours must have a C+ average in the Journalism courses, with C or better in the reporting courses, a C- or better in each other Journalism course, and be recommended for graduation by the School.

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Journalism 28.100

Introduction to Journalism Studies

In first term, the basics of journalistic literacy and writing with an explanation of journalistic style. In second term, an introduction to the social, philosophical and historical contexts of journalism. Prerequisite: For Journalism Honours students only. Lectures and discussion three hours a week.

Journalism 28.216 ★

The Documentary

Examination of the work of individual film makers, of documentary styles and of organizations and institutions in the context of the history of documentary film making, including documentaries made for television. Non-fiction films other than documentaries may be considered. (Also listed as Film Studies 19.216★.)

Precludes additional credit for Journalism 28.215 (19.215).

Prerequisite: Film Studies 19.100 or permission of the School. Lectures and screening two hours, two days a week.

Journalism 28.221

Fundamentals of Reporting

An introduction to the techniques of news gathering, the standard

rules of news and feature writing, elements of news judgment, interviewing skills, a sense of narrative, and ethical reflection. Precludes additional credit for Journalism 28.220 (last offered 1995-96).

Prerequisite: For Second-year Honours Journalism students and students who transfer into the program.

Lectures, discussion and practicum three hours a week.

Journalism 28.225 ★

Journalism's View of the Languages and Institutions of Public Life

An introduction to the major political institutions of Canada; the policy process and the avenues for public participation in government at the federal, provincial and municipal levels; the economy; the arts community; and the like.

Prerequisite: For Second-year Honours Journalism students and students who transfer into the program, and for students enrolled in the Strategic Public Opinion and Policy Analysis specialization area of the Bachelor of Public Affairs and Policy Management.

Lectures and discussion three hours a week.

Journalism 28.251 ★

Communications Law I

A survey of laws that affect the Canadian media. Specific areas include the development of freedom of expression, the Charter of Rights and Freedoms, and statutory and common law limitations on freedoms of the press, including publication bans, libel and contempt of court. (Also listed as Mass Communication 27.251★.)

Precludes additional credit for Journalism 28.351 ★, Mass Communication 27.351 ★ or Law 51.351 ★ (last offered 1996-97).

Prerequisite: Journalism 28.100 or Mass Communication 27.111 or First-Year Seminar 01.127, permission of the School, or registration in the Communication Information Technology Policy specialization area of the Bachelor of Public Affairs and Policy Management.

Lectures and discussion three hours a week.

Journalism 28.300

The Modern Environment

A seminar course for Journalism students in which a number of texts drawn from the social sciences, literature, journalism and philosophy are considered for their contributions to an understanding of contemporary society and the issues that provide the background to much of contemporary journalism.

Prerequisite: Third- or Fourth-year B.J. (Hons.) standing, or permission of the School.

Seminar three hours a week.

Journalism 28.305 ★

International Media Systems

Examination of the flow of global communication and information and their impact on our views of the world. Attention to the relationship between Canadian media and regional and international media institutions and systems. (Also listed as Mass Communication 27.305★.)

Prerequisite: Mass Communication 27.211 or Third- or Fourth-year B.J. (Hons.) standing, or permission of the School, or Third-year standing in the Bachelor of Public Affairs and Policy Management and registration in the Communication Information Technology Policy specialization area.

Lectures and discussion three hours a week.

Journalism 28.306 ★

Comparative Media Studies

The comparative study of one or more of media content, effects, organization, operation, and criticism, and related theoretical perspectives. (Also listed as Mass Communication 27.306★.)

Prerequisite: Mass Communication 27.211 or Third- or Fourth-year B.J. (Hons.) standing, or permission of the School, or Third-year standing in the Bachelor of Public Affairs and Policy

Management and registration in the Communication Information Technology Policy specialization area.

Lectures and discussion three hours a week.

Journalism 28.315 ★

Questions of Documentary Practice

This course examines the theoretical implications of documentary film and documentary television practice. (Also listed as Film Studies 19.315 ★.)

Prerequisite: 1.0 credit in Film Studies at the 200-level, or permission of the School.

Journalism 28.325

Intermediate Reporting

The course will enhance students' skills in information-gathering, news and feature writing, story development, news judgment, computer-assisted reporting, interviewing skills and ethics.

Precludes additional credit for Journalism 28.320 (last offered 1996-97).

Prerequisite: Journalism 28.221.

Lectures and practicum three hours a week.

Journalism 28.326

Introduction to Broadcast Journalism

An introduction to the principles and practices of broadcast reporting. In this practical course students will produce journalistic reports for television and radio. Students will also begin producing newscasts. Precludes additional credit for Journalism 28.220 (last offered 1995-96).

Prerequisite: Journalism 28.221.

Lectures and practicum three hours a week.

Journalism 28.333

Film and Society

An examination of film in relation to social and intellectual developments of the twentieth century. The ways in which the cinema has both shaped and been shaped by some of these developments are considered. (Also listed as Film Studies 19.333.)

Prerequisite: At least 1.0 credit in Film Studies and Third-year standing, or permission of the Discipline or the School.

Screening three hours a week, lecture one hour a week.

Journalism 28.352 ★

Telecommunications Regulation

The law regulating Canadian broadcasting and communications industries. Focus on the Canadian Radio-Television and Telecommunications Commission. Topics may include: administrative formulation of policy, ownership rules, program content and quality, access to the media, cablevision licensing and control, alternative sanctions. (Also listed as Mass Communication 27.352 ★ and Law 51.352 ★.)

Prerequisite: One of Law 51.203, 51.204 or 51.205, or a 200-level Journalism or Mass Communication credit.

Lectures and discussion three hours a week.

Journalism 28.400

Theoretical and Critical Aspects of Journalism

This course will offer a theoretical overview of the news media in Canada, and the conditions under which they operate. It will study critiques of the media, including ethics.

Precludes additional credit for Journalism 28.200 (last offered 1995-96).

Prerequisite: For Fourth-year Honours Journalism students and students who have Fourth-year standing in the Bachelor of Public Affairs and Policy Management and who are registered in the Strategic Public Opinion and Policy Analysis specialization area.

Lectures and discussion three hours a week.

Journalism 28.410 ★

Special Topic

An examination of a topic in journalism not covered in depth in other courses. Topics may vary from year to year.

Seminar three hours a week.

Journalism 28.411 ★

Special Topic

An examination of a topic in journalism not covered in depth in other courses. Topics may vary from year to year.

Seminar three hours a week.

Journalism 28.421

Specialized Reporting

A seminar/workshop in one area of public affairs reporting. Offerings may include politics and government, international issues, the arts, the economy, science and technology, social issues, sports. Emphasis on explanatory/analytical reporting, culminating in an extended work of journalism in any medium, resources permitting.

Prerequisites: Journalism 28.325 and 28.326.

Lectures, discussion and seminars three hours a week.

Journalism 28.425 ★

Professional Practices: Newspaper Publishing

A workshop course designed to give students instruction in community newspaper publishing.

Prerequisite: For Fourth-year B.J. (Hons.) students only.

Note: No more than two of 28.425 ★, 28.426 ★, 28.427 ★ and 28.428 ★ may be taken and cannot be taken simultaneously. 28.425 ★ may not be repeated.

Workshops averaging eight hours a week.

Journalism 28.426 ★

Professional Practices: Radio News and Current Affairs

A workshop course designed to give students instruction in radio news and current affairs.

Prerequisite: For Fourth-year B.J. (Hons.) students only.

Note: No more than two of 28.425 ★, 28.426 ★, 28.427 ★ and 28.428 ★ may be taken and cannot be taken simultaneously. 28.426 ★ may not be repeated.

Workshops averaging eight hours a week.

Journalism 28.427 ★

Professional Practices: Television News and Current Affairs

A workshop course designed to give students instruction in television news and current affairs.

Prerequisite: For Fourth-year B.J. (Hons.) students only.

Note: No more than two of 28.425 ★, 28.426 ★, 28.427 ★ and 28.428 ★ may be taken and cannot be taken simultaneously. 28.427 ★ may not be repeated.

Workshops averaging eight hours a week.

Journalism 28.428 ★

Professional Practices: Specialized Media

A workshop course designed to give students instruction in a specialized area such as radio documentary, video documentary, film documentary, editing, magazine writing, photojournalism. Not all specialties will be offered each year.

Precludes additional credit for Journalism 28.321 ★ (last offered in 1997-98).

Prerequisite: For Fourth-year B.J. (Hons.) students only.

Note: No more than two of 28.425 ★, 28.426 ★, 28.427 ★ and 28.428 ★ may be taken and cannot be taken simultaneously. 28.428 ★ may not be repeated.

Lecture and practicum two hours a week.

Journalism 28.437 ★

Gender and the Journalist

Using theoretical and textual analysis, this course examines the roles that social concepts of gender have played in several of the following: journalism history, journalistic expression and professional practice, professional status, cultural representations and expectations of the journalist, and the alternative or specialized media.

Prerequisite: Third- or Fourth-year B.J. (Hons.) standing, or permission of the School.

Seminar three hours a week.

Journalism 28.490

Honours Tutorial

Students analyze some major achievements in contemporary journalism, through individual or group research. Students also have the opportunity to acquire background and experience in the managerial aspects and production of print and broadcast journalism.

Prerequisite: Fourth-year B.J. (Hons.) standing.

Journalism 28.498

Honours Research

Students in this course have to carry out directed research and prepare a project under faculty supervision. The deadline for completion of the Honours research project is April 1.

Prerequisite: For B.J. Honours students only admitted prior to 1995-96.*

* Students should refer to general Faculty regulations regarding submission of Honours Essays .

School for Languages, Literatures and Comparative Literary Studies:

Classics, German, Italian, Russian, Spanish, Comparative Literary Studies (Arts and Social Sciences)

1419 Dunton Tower
Telephone: 520-5644

Academic Administration

Director, Roland Jeffreys

Teaching Staff

Professors Emeriti

R.L. Jackson (Spanish), **Ernest Oppenheimer** (German), **R. Polzin** (Comparative Literary Studies), **A.T. Tolley** (Comparative Literary Studies),

Professors

Glyn Barratt (Comparative Literary Studies, Russian), **R.C. Blockley** (Classics), **Jacques Chevalier** (Comparative Literary Studies), **Jutta Goheen** (Comparative Literary Studies, German), **F.J. Hernandez** (Comparative Literary Studies, Spanish), **Francesco G. Lorrigo** (Italian, Comparative Literary Studies), **P.J. Roster** (Spanish), **Patricia Smart** (Comparative Literary Studies)

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Assistant Professor

G. Panico (Italian)

Distinguished Research Professors

Trevor Hodge (Classics) **J. Jurado** (Spanish)

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Adjunct Professors

A.S. Fotiou (Classics), **A. Lewinson** (Russian), **B. Mogridge** (German), **T.R. Robinson** (Classics), **P. Varnai** (Russian), **Carl Widstrand** (Classics)

General Information

The School for Languages, Literatures and Comparative Literary Studies administers the programs in Classics, German, Italian, Russian, Spanish, and Comparative Literary Studies. Details of the course offerings in these disciplines can be found under separate entries for Classics (p. 186), German (p.269), Italian (p.304), Russian (p.428), Spanish (p.455) and Comparative Literary Studies (p.192).

Minor in Classics

A Minor in Classics requires 4.0 credits in Classics (with a GPA of 4.0 or better) including:

1. First-Year Seminar in Classics 01.116 or 1.0 credit in Classical Civilization or Greek or Latin at the 100-level.
2. At least one of 13.200 or 13.209 (18.209).
3. At least one of 13.290 (24.290) or 13.291 (or 24.291).
4. 1.0 credit in Classical Civilization at the 300-level or 1.0 credit in Greek or Latin at the 200-level (or above).

A minimum of 2.0 credits must be taken at Carleton.

Minor in German

A Minor in German requires 4.0 credits in German (with a GPA of 6.5 or better), chosen from the list below, in consultation with the German section:

German 22.115, 22.205 (22.120 (2.0 credits) may be taken in place of 22.115 and 22.205), 22.209 ★, 22.213, 22.240, 22.301 ★, 22.302 ★ or 22.311, 22.402 ★, 22.403 ★.

At least 2.0 credits in the Minor must be completed at Carleton.

Minor in Italian

A Minor in Italian requires 4.0 credits in Italian (with a GPA of 4.0 or better) as follows:

1. 26.100 or 26.110 or 26.170.
2. 26.200 or 26.220
3. 26.300
4. 1.0 credit from the following: 26.250; 26.262; 26.360.

At least 2.0 credits in the Minor must be completed at Carleton.

Minor in Russian

A Minor in Russian requires 4.0 credits in Russian (with a GPA of 4.0 or better) including:

1. 36.100
2. 36.202 [36.120 (2.0 credits) may be taken in place of 36.100 and 36.202]
3. 36.302
4. 36.203 or 36.307 ★ and 36.308 ★

At least 2.0 credits in the Minor must be completed at Carleton.

Minor in Spanish

A Minor in Spanish requires 4.0 credits in Spanish (with a GPA of 6.5 or better), chosen from the list below, in consultation with the Spanish section:

Spanish 38.115, 38.203, (38.120 (2.0 credits) may be taken in place of 38.115 and 38.203), 38.205 ★, 38.206 ★ (38.220 (2.0 credits) may be taken in place of 38.203, 38.205 ★ and 38.206 ★), 38.210 ★, 38.211 ★, 38.301 ★, 38.302 ★.

At least 2.0 credits in the Minor must be completed at Carleton.

Law

(Public Affairs and Management)

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Telephone: 520-3690

Academic Administration

Chair, M. Mac Neil

Graduate Supervisor, D. Majury

Undergraduate Supervisor, To be announced

Teaching Staff

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Associate Professors

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Assistant Professors

Jane Dickson-Gilmore, B.A., M.A. (Simon Fraser), Ph.D. (London) • **O. Okafor**, LL.B., LL.M. (Nigeria), LL.M., Ph.D. (British Columbia) • **Rosemary E. Warskett**, B.A. (Queen's), M.A., Ph.D. (Carleton)

Lecturer

Cheryl Picard

Adjunct Research Professors

S. Clark • C. Jaekl • B. Leighton • M. Los • G. Petrauskas • P. Reed

Adjunct Professors

Patrick J. Fitzgerald • J. George Neuspiel • D. Wayand

Sessional Lecturers

L. Atkinson • J. Chaplan • D. Dwoskin • K. Egli • J. Fisher • D. George • J. Hale • D. Jones • D. Koutouki • P. Larose-Edwards • S. Levine • K. MacLean • J. McMunagle • C. McNaught • P. Moise • M.A. Nixon • T. Purvis • R. Ramkay • H. Ruppert • E. Schmidt • V. Steeves • B. Stockfish • C. Stout • S. Tanner • K. Webb • I. Zinger

General Information

The Department of Law provides a unique forum for the study of law in an interdisciplinary environment. Emphasis is placed on an approach that views law as a social phenomenon, and that situates the study of legal structures, rules and institutions within their social, economic and political context. The Department of Law is characterized by an approach to the study of law that is firmly rooted in the social science tradition of enquiry.

The Department does not attempt, in any manner, to offer a "pre-law" program for students intending to pursue professional vocational training in law schools. Nor does completion of courses or programs qualify anyone to practice law or give counsel in legal matters. The interdisciplinary and social sciences perspectives on legal issues offered in the Department's courses do serve as valuable background to a wide variety of career pursuits, including professional and administrative areas as well as supporting further academic studies.

The Department of Law offers programs leading to both B.A. (Honours) and B.A. degrees in Law. Students may also undertake the study of law in a Combined B.A. (Honours) in conjunction with another discipline.

Graduation Regulations

In order to graduate, students must fulfill all University graduation Regulations, see (p. 48), all Faculty regulations including First-Year Seminar and Breadth requirements, see (p. 63), and all Major regulations and requirements set out below.

The grade-point average (GPA) for purposes of entry into, continuation in, and eligibility to graduate from Law shall be calculated over all successfully completed, graded credits used to meet the specific program requirements in Law. Additional courses in Law are not included in the grade-point average.

Overall graduation average

For students graduating in the B.A. (Honours) or Combined B.A. (Honours) program in Law, the overall graduation average shall be calculated over all successfully completed, graded credits counting towards the degree and used to meet the degree requirements.

Law graduation average

For students graduating in the B.A. (Honours) or Combined B.A. (Honours) program in Law, the graduation average in Law shall be

calculated over all successfully completed, graded credits used to meet the specific program requirements in Law. Additional courses in the Major are not included in the graduation average in Law.

Introduction

Notes: Students in any Law program cannot include Law 51.231 ★, 51.232 ★, Business 42.261 ★ or 42.262 ★ towards the fulfillment of their degree requirements, even as options.

B.A. (Honours) Program

Note: Beginning with the 1996-97 academic year, Law 51.498 (Honours Essay) is no longer required as part of the Honours program, and is also no longer offered as an option.

The Honours program is governed by the following regulations:

1. An Honours degree in Law requires at least 9.0 but not more than 12.0 Law credits. No credits beyond this maximum permissible total may be counted towards the 20.0 full credits required for the degree. Law credits must conform to the following prescribed pattern:

- (a) Law 51.100 with a grade of C+ or better; and
- (b) Law 51.203, 51.204 and 51.205 with a GPA of 6.0 or better; and
- (c) Law 51.397 ★; and
- (d) 3.0 additional Law credits at the 400-level or higher; and
- (e) at least 1.5 additional Law credits.

2. Honours students must either:

- (a) have taken Law 51.100 or its equivalent and obtained a grade of C+ or better at the time of declaring a Law Honours, or
- (b) include Law 51.100 or its equivalent in their program immediately after declaring a Law Honours, and obtain a grade of C+ or better in Law 51.100.

Note: Students with a Major in Law are encouraged, but not required, to consider completing a Minor in another discipline in order to broaden their exposure to that discipline.

Combined B.A. (Honours) Program

Note: Beginning with the 1996-97 academic year, Law 51.498 (Honours Essay) is no longer required as part of the Honours program, and is also no longer offered as an option.

The Combined Honours program is governed by the following regulations:

1. A Combined Honours degree in Law requires at least 6.0 but not more than 8.0 Law credits. No credits beyond this maximum permissible total may be counted towards the 20.0 credits required for the degree. The maximum permissible total number of credits in both Major Subjects is 15.0. Law credits must conform to the following:

- (a) Law 51.100 with a grade of C+ or better; and
- (b) 2.0 credits chosen from Law 51.203, 51.204 or 51.205 with a GPA of 6.0 or better; and
- (c) Law 51.397 ★; and
- (d) at least 0.5 additional Law credit at the 300-level or higher; and
- (e) 2.0 additional Law credits at the 400-level or higher; and
- (f) an Honours Essay in the other discipline, if required to meet the requirements of that discipline.

2. Combined Honours students must either:

- (a) have taken Law 51.100 or its equivalent and obtained a grade of C+ or better at the time of declaring a Combined Law Honours, or

(b) include Law 51.100 or its equivalent in their program immediately after declaring a Combined Law Honours and obtain a grade of C+ or better in Law 51.100.

3. Students in a Combined Honours program must satisfy the general University regulations for B.A. Honours programs.

4. Where the Combined Honours is with the School of Journalism and Communication, the degree awarded will be the Honours Bachelor of Journalism with Law. Students are directed to the regulations of the School of Journalism.

B.A. (Honours) and Combined B.A. (Honours) with a Concentration in Law, Policy and Government

General Information

Academic requirements for the Concentration have been defined for B.A. (Honours) and Combined B.A. (Honours) Law students. The minimum GPA required over the courses in this Concentration is 6.5. The Concentration is open to students in the B.A. program. However, it is unlikely that a student could meet the requirements of the Concentration within the 15.0 credits required for the B.A. degree, so that courses extra to the primary degree would have to be taken.

The Concentration in Law, Policy and Government provides an opportunity for focused study on the interaction between law and policy development in the context of governmental decision-making. In addition to meeting the general requirements for an Honours or Combined Honours degree, students will be required to complete a selection of core and optional courses relating to the theme of law, policy and government. Students are expected to declare their intention to complete a Concentration by the end of their second year.

Internship Option

Full-time students in the B.A. (Honours) in Law with a Concentration in Law, Policy and Government have the option to apply for an Internship Option of the Concentration. The Internship Option will require that the student complete an Internship, Law 51.459. Students who complete the Concentration with an Internship will receive the notation on their transcript and degree: B.A. (Honours) in Law with a Concentration in Law, Policy and Government: Internship. The Internship will be a one-term full-time employment arrangement in which students will work for a government department or a governmental or non-governmental organization in an area that will enable them to integrate academic and practical aspects of law relating to policy in government decision-making. Only a limited number of internships will be available, so that eligibility to enroll for this Option will be restricted. Students wishing to complete this Option must apply to the Law Department no later than the date specified by the Department before entering their fourth year of studies. Students must normally be eligible for fourth year standing to register in the Internship, and have a Law GPA of 8.0 or better. Acceptance into the Internship Option will be competitive. Students can be considered for an internship only if they are eligible to work in Canada. The Internship will count as 1.0 credit towards the degree, and will require the submission of a written project report to be evaluated by the Internship supervisor, in addition to the completion of the work component. Students are normally expected to complete at least one term of full-time studies following the completion of the Internship. Students may register in only 0.5 additional credits while completing the Internship requirement. Students will normally only be entitled to complete one internship.

B.A. (Honours) in Law with a Concentration in Law, Policy and Government

The B.A. (Honours) in Law with a Concentration in Law, Policy and Government program is governed by the following regulations:

1. An Honours degree in Law with a Concentration in Law, Policy and Government requires at least 10.0 but not more than 12.0 Law credits. No credits beyond this maximum permissible total may be counted towards the 20.0 credits required for the degree. Law credits must conform to the following pattern:

- (a) Law 51.100 with a grade of C+ or better; and
- (b) Law 51.203, 51.204 and 51.205 with a GPA of 6.0 or better; and
- (c) Law 51.356 ★
- (d) Law 51.397 ★, 51.305 ★, and 51.481 ★; and
- (e) 1.5 credits chosen from 51.300 ★, 51.316 ★, 51.345 ★, 51.350 ★, 51.352 ★, 51.353 ★, 51.354 ★, 51.359 ★, 51.380 ★; and
- (f) 1.5 credits chosen from 51.411 ★, 51.412 ★, 51.451 ★, 51.457 ★, 51.459, 51.467 ★, 51.480 ★, 51.490, 51.491 ★, 51.492 ★; and
- (g) 1.0 additional Law credit at the 400-level.

Notes:

- (i) Students in the Internship Option must complete Law 51.459 and 0.5 additional credit listed in (f), above.
- (ii) Students who count Law 51.490, 51.491 ★ or 51.492 ★ towards the requirements of (f) above must complete an approved topic related to the theme of the Concentration.

2. Honours students must either:

- (a) have taken Law 51.100 or its equivalent and obtained a grade of C+ or better at the time of declaring a Law Honours, or
- (b) include Law 51.100 or its equivalent in their program immediately after declaring a Law Honours, and obtain a grade of C+ or better in Law 51.100.

Note: Students with a Major in Law are encouraged, but not required, to consider completing a Minor in another discipline in order to broaden their exposure to that discipline.

Combined B.A. (Honours) in Law with a Concentration in Law, Policy and Government

The Combined B.A. (Honours) in Law with a Concentration in Law, Policy and Government program is governed by the following regulations:

1. A Combined Honours degree in Law with a Concentration in Law, Policy and Government requires at least 7.0 but not more than 9.0 Law credits. The maximum permissible number of credits in both Majors subjects is 15.0. No credits beyond this maximum permissible total may be counted towards the 20.0 credits required for the degree. Law credits must conform to the following pattern:

- (a) Law 51.100 with a grade of C+ or better; and
- (b) Law 51.205 and one of 51.203 or 51.204 with a GPA of 6.0 or better; and
- (c) Law 51.397 ★
- (d) 51.305 ★, Law 51.356 ★, and 51.481 ★; and
- (e) 0.5 credit chosen from 51.300 ★, 51.316 ★, 51.345 ★, 51.350 ★, 51.352 ★, 51.353 ★, 51.354 ★, 51.359 ★, 51.380 ★; and
- (f) 1.5 credits chosen from 51.411 ★, 51.412 ★, 51.451 ★, 51.457 ★, 51.467 ★, 51.480 ★, 51.490, 51.491 ★, 51.492 ★.

Note: Students who count 51.490, 51.491 ★ or 51.492 ★ towards the requirements of (f) above must complete an approved topic

related to the theme of the Concentration.

2. Students in the Combined Honours in Law with a Concentration in Law, Policy and Government program must either:

- (a) have taken Law 51.100 or its equivalent and obtained a grade of C+ or better at the time of declaring a Combined Law Honours, or
- (b) include Law 51.100 or its equivalent in their program immediately after declaring a Combined Law Honours, and obtain a grade of C+ or better in Law 51.100.

3. Where the Combined Honours is with the School of Journalism and Communication, the degree awarded will be the Bachelor of Journalism with Law with a Concentration in Law, Policy and Government. Students are directed to the regulations of the School of Journalism and Communication.

B.A. (Honours) and Combined B.A. (Honours) with a Concentration in Business Law

Academic requirements for the Concentration have been defined for B.A. (Honours) and Combined B.A. (Honours) Law students. The minimum GPA required over the courses in this Concentration is 6.5. The Concentration is open to students in all Honours Law programs as well as those in the B.A. program. However, it is unlikely that a student could meet the requirements of the Concentration within the 15.0 credits required for the B.A. degree, so that credits additional to the 15.0 would have to be taken.

The Concentration in Business Law provides an opportunity for focused study of the legal environment in which businesses operate. In addition to meeting the general requirements for a B.A. (Honours) or Combined B.A. (Honours) degree, students will be required to complete a selection of core and optional courses relating to the theme of business law. Students are expected to declare their intention to complete a Concentration by the end of their second year. Students wishing further exposure to business issues are advised to take a Minor in Business.

Field Placement Option

Full-time students in the B.A. (Honours) in Law program with a Concentration in Business Law have the option to apply to complete a 0.5 credit Field Placement in Business Law, Law 51.428 ★. The Field Placement would be with an approved business organization or in an approved business environment that will enable students to integrate academic and practical aspects of law relating to business. The field placement may require up to eight hours of paid or unpaid work per week for a term. Only a limited number of field placements will be available, so that registration in this option will be restricted. Students wishing to complete this option must apply to the Law Department no later than a date yet to be specified before entering their Fourth year of studies. Students must normally be eligible for Fourth-year Honours standing before registering in the Field Placement, and have a Law GPA of 8.0 or better. Acceptance into the Field Placement will be competitive.

B.A. (Honours) in Law with a Concentration in Business Law

The B.A. (Honours) in Law with a Concentration in Business Law is governed by the following regulations:

1. An Honours degree in Law with a Concentration in Business Law requires at least 10.0 but not more than 12.0 Law credits. No credits beyond this maximum permissible total may be counted towards the 20.0 full credits required for the degree. Law credits must conform to the following pattern:

- (a) Law 51.100 with a grade of C+ or better; and
- (b) Law 51.203, 51.204 and 51.205 with a GPA of 6.0 or better; and
- (c) Law 51.397 ★, 51.303 ★, 51.321 ★, and 51.326 ★; and

(d) 1.0 credit chosen from 51.322 ★, 51.325 ★, 51.327 ★, 51.328 ★, 51.341 ★, 51.345 ★; and

(e) 2.0 credits chosen from 51.420 ★, 51.422 ★, 51.428 ★, 51.429 ★, 51.432 ★, 51.442 ★, 51.481 ★, 51.490, 51.491 ★, 51.492 ★; and

(f) 1.0 additional Law credit at the 400-level.

Note: Students who count Law 51.490, 51.491 ★ or 51.492 ★ towards the requirements of (e) above must complete an approved topic related to the theme of the Concentration.

2. Honours students must either:

(a) have taken Law 51.100 or its equivalent and obtained a grade of C+ or better at the time of declaring a Honours Law, or

(b) include Law 51.100 or its equivalent in their program immediately after declaring a Law Honours, and obtain a grade of C+ or better in Law 51.100.

Note: Students with a Major in Law are encouraged, but not required, to consider completing a Minor in another discipline in order to broaden their exposure to that discipline.

Combined B.A. (Honours) in Law with a Concentration in Business Law

The Combined Honours in Law with a Concentration in Business Law is governed by the following regulations:

1. A Combined Honours degree in Law with a Concentration in Business Law requires at least 7.0 but not more than 9.0 Law credits. The maximum permissible number of credits in both Majors subjects is 15.0. No credits beyond this maximum permissible total may be counted towards the 20.0 full credits required for the degree. Law credits must conform to the following pattern:

(a) Law 51.100 with a grade of C+ or better; and

(b) Law 51.203, and either 51.204 or 51.205 with a GPA of 6.0 or better; and

(c) Law 51.397 ★, 51.303 ★, 51.321 ★, and 51.326 ★; and

(d) 2.0 credits chosen from 51.420 ★, 51.422 ★, 51.428 ★, 51.429 ★, 51.432 ★, 51.442 ★, 51.481 ★, 51.490, 51.491 ★, 51.492 ★;

Note: Students who count Law 51.490, 51.491 ★ or 51.492 ★ towards the requirements of (d) above must complete an approved topic related to the theme of the Concentration.

2. Honours students must either:

(a) have taken Law 51.100 or its equivalent and obtained a grade of C+ or better at the time of declaring a Combined Law Honours, or

(b) include Law 51.100 or its equivalent in their program immediately after declaring a Combined Law Honours, and obtain a grade of C+ or better in Law 51.100.

3. Where the Combined Honours is with the School of Journalism and Communication, the degree awarded will be the Bachelor of Journalism with Law with a Concentration in Business Law. Students are directed to the regulations of the School of Journalism and Communication.

B.A. Program

The B.A. program is governed by the following regulations:

1. A B.A. degree in Law requires at least 6.0 but not more than 8.0 Law credits. No credits beyond this maximum permissible total may be counted towards the 15.0 credits required for the degree. Law credits must conform to the following pattern:

(a) Law 51.100 with a grade of C- or better; and

(b) 2.0 credits chosen from Law 51.203, 51.204 or 51.205; and

(c) at least 3.0 additional Law credits, one of which must be at the 300-level or higher.

2. Students must either:

(a) have taken Law 51.100 or its equivalent, and obtained a grade of C- or better at the time of declaring a Law Major, or

(b) include Law 51.100 or its equivalent in their program immediately after declaring a Law Major, and obtain a grade of C- or better in Law 51.100.

Note: Students with a Major in Law are encouraged, but not required, to consider completing a Minor in another discipline in order to broaden their exposure to that discipline.

3. Students in the B.A. program must satisfy the general University regulations for B.A. programs.

Minor in Law

Students in other disciplines may undertake a Minor in Law by completing the required 4.0 credits in Law with a GPA of 4.0 or better in the Minor requirements.

Requirements are:

1. Law 51.100

2. 2.0 credits chosen from Law 51.203, 51.204, or 51.205

3. 1.0 credit in Law at the 300 level or higher

Note: At least 2.0 credits must be taken at Carleton.

Criminology and Criminal Justice Program

For details see p. 205.

Human Rights Program

The Department of Law offers a Combined B.A.(Honours) in Human Rights in collaboration with the Departments of Philosophy, Political Science and Sociology/Anthropology. Students interested in combining a B.A.(Honours) in Law with Human Rights should consult p. 283 for further details.

Study Abroad Option Certificate in Financial Studies and Law

The Department participates in an International Exchange with the School of Financial Studies and Law at Sheffield Hallam University in the U.K. The Exchange provides an opportunity for students in the B.A. (Honours) in Law program to study law in a comparative setting within a professional law school firmly rooted in the social scientific study of law. Students accepted into the Exchange select courses from the LL.B. and Financial Studies syllabi of the School and from the Social Studies program at Sheffield Hallam University. Students are eligible to apply to participate in the Exchange for their Third or Fourth year of study. Third-year standing in Law and completion of 51.100 and two of 51.203, 51.204, and 51.205 are the minimum requirements to be accepted into the Exchange. Students interested in the Exchange should contact the Department as early as possible, and in any event must apply by March 1. Selection will be made by the Department of Law based on GPA overall program performance, and potential for success in the Exchange.

In addition to receiving credits toward their B.A. (Honours), students who successfully complete 6 units in the School of Financial Studies and Law at Level 2 or above will receive a Certificate of Financial Studies and Law from Sheffield Hallam University. Interested students should contact the Department.

Off-Campus Courses

Introductory Law courses may be offered off-campus by the Department of Law. The particular course(s) offered and location(s)

will be announced well in advance of the period of registration.

Prerequisites

Students should note that many Law courses have designated prerequisites. Students who have not obtained credit for designated prerequisites may be required to withdraw from the applicable course.

In some instances permission of the Department may be granted as an alternative to a designated prerequisite. It must not be assumed that such permission will be granted automatically. Further, it may be granted subject to certain conditions, including the fulfillment of preliminary reading requirements or the submission of some written work. Students who have not obtained permission of the Department may be required to withdraw from the applicable course.

Waiver of Prerequisites

The formal requirements can only be waived by express written permission of the Department in exceptional circumstances and on special written application.

Cross-Listed Courses

Students should note that the Department of Law will normally regard a cross-listed course as a credit in the department in which the student registers. Students are advised to consult with the relevant departments before deciding under which department they should register in cross-listed courses.

Requirement for Breadth, for students in B.A. or B.A.(Honours) degrees

Category for Breadth	Courses in this unit
The temporal dimension of human societies, analyzing times before the present era or societies other than our own	(51.)335 ★
The artifacts of the imagination in literature and/or other forms, or that addresses the life of the imagination and culture.	(01.)120
The understanding of social, technological and/or natural processes and the ways in which that understanding is obtained in science and social science.	(51.)300 ★, 301 ★, 305 ★, 358 ★, 380 ★, 01.118, 01.121
Matters of human values, ethics and social responsibilities	(51.)100, 311 ★, 312 ★, 353 ★, 01.120, 01.122

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

First-Year Seminar in Law 01.118

Law and Cyberspace

Law and the challenges posed by new technologies of the information society. Topics include the Internet and freedom of expression, pornography, hate speech, privacy, confidentiality, regulation of communications media, access to information and intellectual

property; impact on democracy, national sovereignty, equality, and individual rights. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar in Law 01.119

Law and Literature

Reading literature to explore how law is perceived and understood by society in which it operates; examination of assumptions and concerns about role of law, lawyers, judges and other participants in the legal system through study of fiction dealing with significant legal and moral issues. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar in Law 01.120

Law and Dispute Resolution

Approaches to the legal resolution of disputes in both a theoretical and empirical context. The theory and practice of adjudication and mediation compared. Methodological differences between these processes for resolving disputes; theories of justice which underlie each process. Limited enrolment.

Prerequisite: Normally restricted to students entering the First-year of a B.A. program.

Seminars three hours a week.

First-Year Seminar in Law 01.121

Governance and the Rule of Law

The historical development and theoretical foundations of the modern concept of the rule of law. The contradictions between theory and legal practice as illustrated in the discretion exercised in the administration of criminal justice and in environmental regulation. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar in Law 01.122

Global Governance and Human Rights

The legal implications of a shift from an emphasis on the sovereignty of the nation-state to governance through international or transnational institutions and non-governmental organizations. The role played by human rights to ensure that this governance will be democratic. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

Law 51.100

Introduction to Legal Studies

Concepts, sources, nature and function of law; law and social change; historical and constitutional foundations of the Canadian legal system; common and civil law traditions; statutory interpretation and precedent; legal institutions; the role of judges, lawyers and lay persons; accessibility; alternative dispute resolution.

Precludes additional credit for Law 51.101 ★ and 51.102 ★.

Lectures two hours a week and group workshops one hour every second week.

Law 51.203

Introduction to Private Law Relationships

Origins and scope of modern private law relationships; values espoused by legal personality, property and obligations arising from contracts, torts and the law of restitution will be studied; interaction of private law categories; role of the state in ordering private relations.

Prerequisite: Law 51.100.

Lectures three hours a week.

Law 51.204

An Introduction to Criminal Law in Context

Canadian criminal process; nature and purpose of criminal law; criminal acts distinguished from civil wrongs; origins and development of principles and procedures; categories of criminal conduct; role of enforcement agencies and courts; criminal correction; relationship between criminal activity and deviant behavior.

Precludes additional credit for Law 51.234.

Prerequisite: Law 51.100.

Lectures three hours a week.

Law 51.205

Introduction to Public Law

Law relating to the state and its relationship to other legal persons; basic principles of constitutional law, administrative law and selected areas; special features and problems of public law; implications of the expanded new role of modern governments; legal and alternative processes.

Prerequisite: Law 51.100 or Political Science 47.100.

Lectures three hours a week.

Law 51.215 ★

Law, Social Justice and Human Rights

Theories and practices of law and social justice. Issues examined may include: civil democracy and repression; global governance and the rule of law; democratic movements and social power; human rights instruments, regimes and remedies; armed conflict; and humanitarian intervention.

Prerequisite: Second-year standing.

Lectures and discussion three hours a week.

Law 51.300 ★

The Legal Process

Advanced topics in the legal process such as the nature and function of law, dispute resolution and law-making.

Precludes additional credit for Law 51.200.

Prerequisite: Third-year standing.

Lectures three hours a week.

Law 51.301 ★

Women and the Legal Process

How the legal process has affected the status of women. Areas of concentration within the Canadian context include the criminal law, citizenship and immigration, education, employment, and welfare and social services.

Prerequisite: Third-year standing.

Lectures three hours a week.

Law 51.303 ★

Contracts

The enforcement of promises and agreements; basic doctrines and underlying principles of the law of contract are studied from formation of the contract to remedies for breach of contract; role of contract for economic and social purposes is also considered.

Prerequisite: Law 51.203.

Lectures three hours a week.

Law 51.305 ★

Law and Regulation

Definitions and goals of regulation; contemporary theories and debates about legal and non-legal approaches to regulation. Approaches studied may include market mechanisms, public agency regulation, self-regulation and governance in co-operation with associations in civil society.

Prerequisite: Law 51.203 or 51.205.

Lectures three hours a week.

Law 51.306 ★

Mediation

Theory and practice of mediation; historical roots and influences; contrasts with formal litigation and other dispute resolution proc-

esses; issues of social and legal control; critiques, including feminist, Marxist and critical race theory; issues of power, gender, race and class; application to contemporary issues and disputes.

Prerequisites: Law 51.100 and one of 51.203, 51.204, 51.205 or Business 42.261 ★.

Lectures three hours a week.

Law 51.311 ★

Philosophy of Law: The Nature of Law

The concept of law, leading theories of law and related concepts such as rules and obligations, power and authority, coercion, and justice. (Also listed as Philosophy 32.311 ★.)

Precludes additional credit for Law 51.310 or Philosophy 32.350.

Prerequisite: Third-year standing.

Lectures three hours a week.

Law 51.312 ★

Philosophy of Law: The Logic of the Law

The nature of legal reasoning and concepts particularly used in the course of legal reasoning such as rights and duties, ownership and possession, liability and punishment. (Also listed as Philosophy 32.312 ★.)

Precludes additional credit for Law 51.310 or Philosophy 32.350.

Prerequisite: Third-year standing.

Lectures three hours a week.

Law 51.315 ★

Theory of Law and Politics

Theories of law and politics; prominent thinkers and schools of thought; influence on legal and political institutions. Topics include law and ethics, justice and equity, positivism and natural law, state absolutism, codifications, and anthropological and historical theories of law and society.

Precludes additional credit for Law 51.315.

Prerequisites: Law 51.100 and one of 51.203, 51.204, 51.205, 51.215 ★ or Political Science 47.100 and 47.230.

Law 51.316 ★

Sociology of Law

Development of law in the context of modernity, the West and capitalism. Writings on law by Durkheim, Weber and Marx; their influence on the development of the sociology of law. (Also listed as Sociology 53.381 ★.)

Prerequisite: One of Law 51.203, 51.204, or 51.205.

Law 51.321 ★

The Legal Framework of Business Enterprises

Forms of carrying on business activity: proprietorships, partnerships, corporations and Crown entities. The rights and obligations of such business enterprises both internally and in relation with other persons. The relationship between legal form and economic function. The role of state intervention.

Precludes additional credit for Law 51.321.

Prerequisite: Law 51.203.

Lectures three hours a week.

Law 51.322 ★

Information Technology Law and Intellectual Property

Critical assessment of copyright, patents, trademarks, trade secrets and other forms of intellectual property; regulation and governance of information technology including self-regulation, standard setting, licencing, competition policy and international dimensions.

Prerequisite: One of Law 51.203 or 51.205

Lectures three hours a week.

Law 51.323 ★

The Legal Nature of Property

An examination of the nature and functions of property as a legal and social institution, with particular reference to theories of property, the scope of property interests, and the relationship between individual property rights and the state.

Precludes additional credit for Law 51.323.

Prerequisite: Law 51.203.

Lectures three hours a week.

Law 51.325 ★

Consumer Law

Need for consumer protection in the provision of goods and services; traditional legal protection by statute and common law; legislative responses to consumer pressures; judicial response in recent Canadian, English and American law; reform of consumer law.

Precludes additional credit for Law 51.325.

Prerequisite: Law 51.203 or 51.220 or 51.232 ★ or Business 42.262 ★.

Lectures three hours a week.

Law 51.326 ★

Banking Law

The law relating to banks and banking; the nature of the legal relationship created; legal rights and duties of the parties involved. Consumer and corporate aspects of banking (including computerization and electronic funds transfers); regulations of banking.

Prerequisite: Law 51.203 or 51.220 or 51.232 ★ or Business 42.262 ★.

Lectures three hours a week.

Law 51.327 ★

International Economic Law: Trade and Investment

Topics may include: the international sale of goods, finance of transnational transactions, international carriage of goods, insurance, agency and trading houses; other forms of trade, e.g., counter-trade, foreign investment; dispute settlement of international disputes by litigation and arbitration.

Precludes additional credit for Law 51.322.

Prerequisite: Law 51.203 or 51.232 ★ or Business 42.262 ★.

Law 51.328 ★

International Economic Law: International Regulation

International regulation of trade and investment through bilateral, regional and multilateral treaties and agreements. Topics may include: WTO, NAFTA, the EU, UNCTAD, intergovernmental commodity agreements, dispute settlement.

Precludes additional credit for Law 51.322.

Prerequisite: Law 51.203 or 51.205.

Lectures three hours a week.

Law 51.333 ★

Injury, Compensation and the Law

Problems of injury compensation; legal responses in their economic, historical, comparative, philosophical or sociological contexts; definitions of personal injury; objectives and effectiveness of legal intervention; forms of compensation; relation between private law and state regulation.

Precludes additional credit for Law 51.333.

Prerequisite: Law 51.203.

Lectures three hours a week.

Law 51.335 ★

Law, Crime and Society in Historical Perspective

The history of the relationship between the criminal law system and society. Changing issues in the criminal law and the nature of institutional responses, covering medieval to early nineteenth-century England and nineteenth to early twentieth-century Canada.

Prerequisite: Third-year standing.

Lectures three hours a week.

Law 51.336 ★

Criminal Law: Process and Politics

Criminal law process in Canada; structure and use of the process examined for fairness, defects, and possible reform initiatives. Issues concerning gender, race and class bias in the implementation and application of the criminal law.

Prerequisite: Law 51.204.

Lectures three hours a week.

Law 51.337 ★

Young Offenders and the Law

A review of the Young Offenders Act within the framework of the Canadian justice system, with particular emphasis on historical and philosophical developments and objectives. Current topics include: constitutional issues, procedure, confessions, transfers, sentencing options, alternative measures, reviews, and possible amendments.

Precludes additional credit for Law 51.493 ★ (if taken in 1987-88).

Prerequisite: Law 51.204.

Lectures three hours a week.

Law 51.341 ★

Employment Law

Legal regulation of the employment relationship; its contractual basis; defining employment; rights and duties of employees and employers; termination of employment; statutory regulation through employment standards legislation, human rights codes, workers' compensation acts, occupational health and safety and related statutes.

Precludes additional credit for Law 51.320.

Prerequisite: Law 51.203, or 51.205, or Business 42.261 ★.

Lectures three hours a week.

Law 51.342 ★

Landlord and Tenant Relations

An examination of the nature and history, creation and termination of the landlord and tenant relationship in Ontario, focusing on the rights and duties of both landlord and tenant under common law and statute and the legal distinction between residential and commercial tenancies. Particular attention is given to the recent statutory regulation of residential tenancies in Ontario, and the implications of rent control and security of tenure for housing policy.

Precludes additional credit for Law 51.320.

Prerequisite: Law 51.203 or 51.220.

Lectures three hours a week.

Law 51.345 ★

Labour Law

Role of law in industrial relations; effect of law on collective bargaining relationships; recognition of bargaining agent; regulation of bargaining; administration of the collective agreement; methods of conflict resolution.

Precludes additional credit for Law 51.441.

Prerequisite: Law 51.200 or 51.203 or 51.205. Permission may be given to students in Business or Directed Interdisciplinary Studies who have completed Law 51.231 ★ or Business 42.261 ★.

Lectures three hours a week.

Law 51.348 ★

Legal Aspects of Sport

Legal regulation of sporting activities in Canada. Subjects include constitutional power to regulate sport, government involvement in sports administration, sports violence, civil liability for sports injuries, sex discrimination, professional and intercollegiate leagues, player employment contracts, disciplinary proceedings.

Prerequisite: Law 51.203 or 51.205.

Lectures three hours a week.

Law 51.350 ★

Constitutional Law

An investigation of the Canadian constitution. Sovereignty, the nature and units of executive, legislative, and judicial power in Canada as interpreted by the courts. The distribution of powers under the Canadian constitution including an investigation of contemporary problems of federalism. Problems of judicial review.

Precludes additional credit for Law 51.450.

Prerequisite: Law 51.205 or a Political Science course in Canadian government.

Lectures three hours a week.

Law 51.351 ★**Law and Communications**

The relationship between law, mass media and other forms of communications technology such as the Internet. Specific topics may include: the legal framework of freedom of expression and of the press; defamation, privacy, national security and contempt of court; human rights and the Charter.

Precludes additional credit for Mass Communication 27.251 ★ or Journalism 28.251 ★ or Mass Communication 27.351 ★ or Journalism 28.351 ★.

Prerequisite: One of Law 51.203, or 51.204, or 51.205.

Law 51.352 ★**Telecommunications Regulation**

The law regulating Canadian broadcasting and communications industries. Focus on the Canadian Radio-Television and Telecommunications Commission. Topics may include: administrative formulation of policy, ownership rules, program content and quality, access to the media, cablevision licensing and control, alternative sanctions. (Also listed as Journalism 28.352 ★ and Mass Communication 27.352 ★).

Prerequisite: One of Law 51.203, 51.204 or 51.205; or 1.0 credit at the 200-level in Journalism or Mass Communication.

Lectures three hours a week.

Law 51.353 ★**Equality and Anti-Discrimination Law**

Human rights issues and law in Canada; history and present day experiences of discrimination; critical exploration of law's effectiveness in responding to discrimination; meaning(s) of equality and discrimination; focus on Human Rights Codes - interpretation, administration, enforcement - some reference to s.15 of the Charter. Precludes additional credit for Law 51.353.

Prerequisite: Law 51.204 or 51.205.

Lectures and seminars three hours a week.

Law 51.354 ★**Law and Aboriginal Peoples of Canada**

The legal situation of aboriginal peoples in Canada. Topics include status, aboriginal rights, treaties, legislative jurisdiction and the constitutional framework, aboriginal claims, and self-government. Comparative references to aboriginal policy in other countries.

Prerequisite: Law 51.205 or 51.353 ★ or 51.353, or 51.359 ★.

Lectures three hours a week.

Law 51.356 ★**Administrative Law**

Structure and procedure of Canadian administrative authorities; policy, statutory and judicial environments in which they operate. Topics include: techniques for implementing public policy and structuring public authorities; statutory interpretation; procedural safeguards; exercise of statutory discretion; reconciling efficiency and fairness.

Precludes additional credit for Law 51.456 ★.

Prerequisites: One of Law 51.205, 51.305 ★, or 51.352 ★ (Journalism 28.352 ★, Mass Communication 27.352 ★), or Political Science 47.200.

Lectures three hours a week.

Law 51.358 ★**Health Law**

Legal/ethical issues in health care regulation. Topics may include: regulation of health professions; economics of health care; informed consent/choice; regulation of drugs, devices and research; medical malpractice and other liability; mental health issues; patient/client records.

Precludes additional credit for Law 51.355 ★ and 51.493 ★ B (if taken in 1994-95 or 1995-96).

Prerequisite: Law 51.203, 51.204, or 51.205.

Lectures three hours a week.

Law 51.359 ★**The Charter of Rights: Selected Topics**

Selected issues in the Canadian Charter of Rights and Freedoms. For 1999-2000, the topic will be Lesbian and Gay Charter Issues.

Precludes additional credit for Law 51.353.

Prerequisite: Law 51.204 or 51.205.

Lectures and seminars three hours a week.

Law 51.363 ★**Public International Law**

An examination of the role of law in contemporary international relations. Nature, history and sources of international law; international personality of states; the status of international organizations and individuals; creation and effect of international obligations; importance and functions of law in the settlement of international disputes.

Precludes additional credit for Law 51.363.

Prerequisite: Law 51.100 or 51.205, or Public Affairs and Policy Management 58.100 or a Political Science or History course in international relations.

Lectures three hours a week.

Law 51.364 ★**The Law of International Organizations**

Nature, character, legal status and jurisdiction of intergovernmental international organizations. Rights and duties of states arising from membership in international organizations. Distinction between international and supra-national institutions. United Nations system, selected subsidiary organs, and specialized agencies; non-governmental organizations at times of crisis.

Precludes additional credit for Law 51.460 ★.

Prerequisite: Law 51.363 ★ or 51.363.

Law 51.380 ★**Law of Environmental Quality**

Various aspects of environmental law; pollution control, legal actions and remedies; legal foundations for participation in decision-making processes. Social, economic and political forces influencing the formulation and implementation of environmental law. Alternative forms of regulation that may articulate different demands.

Precludes additional credit for Law 51.380.

Prerequisite: Law 51.203, 51.204 or 51.205.

Lectures three hours a week.

Law 51.384**Law of the Family**

Legal framework surrounding the family and family relationships in Canadian society. Topics include marriage and cohabitation, matrimonial support, custody and access, adoption, child protection, domestic violence, dissolution of marriage. State interventions through law; law and change in family structures; equality issues; dispute resolution processes.

Precludes additional credit for Law 51.284.

Prerequisite: Law 51.203.

Lectures three hours a week.

Law 51.397 ★**Legal Research Methods**

Basic methods in the design and execution of research projects in law in a social science context. Research principles; theoretical approaches; law-related materials and research procedures. Computer-assisted legal research; problem solving, bibliographic and citation skills.

Prerequisites: Any two of Law 51.203, 51.204, or 51.205 and Honours standing.

Seminars three hours a week.

Law 51.401 ★**Law, Family and Gender**

Relationship between family law and ideology of the family, gen-

der roles and the reproduction of family structures. Social ramifications of family law; potential for family law reform as an agency of social change.

Prerequisites: Law 51.301 ★ or 51.384 and Fourth-year Honours standing.
Seminars three hours a week.

Law 51.402 ★

Feminist Theories of Law

The literature comprising feminist perspectives on law; theoretical bases of these perspectives; place of feminist theories within other critiques of law; significance of different feminist theories for equality theory and law reform strategies; unique contributions of the various perspectives.

Prerequisite: Law 51.301 ★ or Fourth-year Honours standing.
Seminars three hours a week.

Law 51.406 ★

Church and State in the Laws of England, Scotland and Canada

Legal nature of the interaction of church and state within an historical framework. Emphasis on Canada after the Charter of Rights and Freedoms and on religious pluralism and resistance to state intervention in church affairs. Interdisciplinary readings drawn from legal, historical and theological sources.

Prerequisite: Law 51.100.
Seminars three hours a week.

Law 51.410 ★

Modern Legal Theory

Realist and post-realist legal scholarship; emphasis on Canadian, American and British approaches. Topics include the Canadian treatise tradition, American legal realism, empirical approaches to legal problems, the sociological movement in law, critical and Canadian feminist legal scholarship, Marxian theories of law, normative economic theory.

Prerequisites: Any two of Law 51.203, 51.204, or 51.205.

Law 51.411 ★

Contemporary Theories of Justice

Selected major contemporary theories of justice such as those associated with Rawls, Walzer, and Habermas, with emphasis on both their procedural and substantive elements and their concrete ramifications for law, policy and political practice.

Precludes additional credit for Law 51.494A ★ (if taken between 1995-96, and 1997-98).

Prerequisite: Fourth-year Honours standing.
Seminars three hours a week.

Law 51.412 ★

Contemporary Controversies in Rights Theory

Selected controversies in rights theories and practices. Illustrative questions may include: Are human rights culturally relative? Can rights be justified after the demise of natural rights philosophy? Do rights undermine "difference"? Do communities benefit from a rights-based culture? Are "rights" forms of governance?

Precludes additional credit for Law 51.353.
Prerequisite: Fourth-year Honours standing.
Seminars three hours a week.

Law 51.413 ★

Special Topic in the Philosophy of Law

Detailed study of a special topic in philosophy of law.
(Also listed as Philosophy 32.447 ★)

Prerequisite: Eligibility for Fourth-year standing in a Law or Philosophy Honours program or permission of either Department.
Seminar two hours a week.

Law 51.414 ★

Special Topic in the Philosophy of Law

Detailed study of a special topic in philosophy of law. (Also listed

as Philosophy 32.448 ★)

Prerequisite: Eligibility for Fourth-year standing in a Law or Philosophy Honours program or permission of either Department.
Seminar two hours a week.

Law 51.417 ★

Law in Modern Society

Sociological and legal theory accounts of the changing role and function of law in modern society with particular reference to advanced capitalist societies. Topics include: the welfare state and the use of regulatory law; juridification and legalisation; counter-trends, deregulation, informalism, legal pluralism. (Also listed as Sociology 53.433 ★.)

Prerequisite: Law 51.311 ★, 51.315, 51.316 ★, or Sociology 53.381 ★.
Seminars three hours a week.

Law 51.420 ★

Advanced International Economic Law

Selected topics in international economic law. May include: the legal regulation of international economic activity; methods of dispute settlement; standardization and development of an autonomous international trade law; and selected conventions and institutions governing international economic law.

Prerequisite: Law 51.327 ★ or 51.328 ★
Seminar three hours a week.

Law 51.422 ★

Legal Accountability of Management

Role, function, and legal regulation of persons managing business enterprises. Status, social responsibility, fiduciary obligations and rights. Control and accountability of managers, obligations owed to the enterprise unit itself, constitutional rights of members, standards imposed by statutory regulation.

Precludes additional credit for Law 51.321.

Prerequisite: Law 51.321 ★.
Lectures three hours a week.

Law 51.428 ★

Field Placement in Business Law

Field placement in an approved business organization or environment. Evaluation consists of assessment by employer and student report graded by the departmental placement supervisor interpreting theoretical and practical experiences in business law.

Prerequisite: Fourth-year Honours standing; registration in the Concentration in Business Law; and permission of the Department.

Field placement one day a week.

Law 51.429 ★

Advanced Topics in Business Law

Examination of a selected advanced topic in business law. For 1999-2000, the topic for Section A will be Commercial Bankruptcy. The topic for Section B will be Legal Issues in Electronic Commerce and Technology.

Prerequisite: Fourth-year Honours standing or permission of the Department.
Seminars three hours a week.

Law 51.432 ★

Legal Regulation of Corporate Crime

Legal, policy and theoretical perspectives on the regulation of corporate crime. Nature and causes of corporate crime. Selected case studies on the role of the state in regulating corporate behaviour. Failure of the criminal justice system to respond to corporate crime.

Prerequisites: Law 51.204 and one of Law 51.305 ★, 51.321 ★ or 51.380 ★, or 51.321.
Seminars three hours a week.

Law 51.435 ★

Criminal Justice Reform: Theory and Practice

Social transformation and criminal justice reform. Theoretical and practical reasons for the use of criminal law as an instrument of

social control. Specific reform initiatives and processes. Alternate responses to social problems.

Prerequisites: Law 51.204 or 51.234 and Fourth-year Honours standing.

Seminars three hours a week.

Law 51.436 ★

Contemporary Issues in Criminal Law

Selected issues and problems in the area of criminal law. The topics may vary from year to year depending on demand and interest. The topics are announced in advance of registration. For 1999-2000, the topic for Section A will be Current Issues in Policing. The topic for Section B will be Organized Crime. Other topics may also be offered and students are advised to consult with the Department.

Prerequisite: Fourth-year Honours standing.

Law 51.437 ★

Legal Medical Issues in Criminal Law

Legal-medical issues, conflicts and relationships in the field of social control. Topics include mental disorder and criminal liability, diversion of offenders to civil commitment in hospital, insanity, automatism, fitness to stand trial, prediction of dangerousness, regulation of psychoactive drugs.

Prerequisites: Law 51.204 and Fourth-year Honours standing.

Seminars three hours a week.

Law 51.438 ★

Sentencing: Theories and Practice

Theories of sentencing, current sentencing laws and practices, perceptions of sentencing. Data on sentencing practice across Canada. Reforms in other jurisdictions. Critical review of the Canadian Sentencing Commission. Multidisciplinary approach using research and theory in law, criminology, social psychology and sociology.

Prerequisites: Law 51.204 and Fourth-year Honours standing. This course may not be taken by students who have completed the course as a special topics course.

Seminars three hours a week.

Law 51.439 ★

Criminal Proceedings and Dissent: Political Offences and National Security Measures

Historical and contemporary analysis of legal responses of Canadian governments to dissent, political opposition, insurrection, etc. Includes trial of political offences (treason, sedition, riot), national security measures (War Measures/Emergencies Act, Official Secrets Act), and other special powers (police, labour, immigration, parliamentary privilege, etc.)

Precludes additional credit for Law 51.436 ★ (if taken in 1990-91).

Prerequisites: Fourth-year Honours standing, Law 51.353 ★ or Law 51.359 ★ or Law 51.335 ★.

Seminars three hours a week.

Law 51.442 ★

Employment Dispute Resolution

Theory and practice of dispute resolution in employment relations; analysis of such techniques as negotiation, grievance and interest arbitration, mediation, investigation and litigation applied to a range of employment disputes such as collective agreements, termination of employment, discrimination, harassment, occupational health and safety, etc.

Precludes additional credit for Law 51.440 ★.

Prerequisites: Fourth-year Honours standing and one of Law 51.306 ★ or 51.341 ★ or 51.345 ★, or Business 42.262 ★ and 42.317 ★.

Seminars three hours a week.

Law 51.451 ★

Selected Problems in Comparative Constitutional Law

The topics of this course may vary from year to year. Topics may include comparative federalism, comparative study of civil liberties and human rights, comparative bases and theories of judicial re-

view in their social, political, economic or historical contexts.

Precludes additional credit for Law 51.450.

Prerequisite: Law 51.350 ★.

Law 51.454 ★

Aboriginal Peoples and the Canadian Criminal Legal System

Aboriginal peoples and the administration of Canadian criminal justice including policing, courts, corrections and aftercare. Content and effects of past and present policies, processes and laws. Alternatives such as self-government and self-determination; potential approaches to an appropriate justice system for Aboriginal peoples.

Precludes additional credit for Law 51.436 ★ B (if taken in 1992-94).

Prerequisites: Law 51.204 and Fourth-year Honours standing.

Seminars three hours a week.

Law 51.457 ★

Administrative Law and Control

An examination of characteristics and selected problems of control of administrative action. Topics include: varieties of traditional and constitutional, legal and judicial control, impact of the Charter, reforms to administrative law control systems in Canada, and comparisons with developments outside Canada. Also offered at the graduate level, with additional or different requirements, as Public Administration 50.537, for which additional credit is precluded.

Prerequisites: Law 51.205 or 51.305 ★ or 51.356 ★ or Public Administration 50.536.

Lectures three hours a week.

Law 51.459

Internship in Law, Policy and Government

A one-term, full-time work placement in a government department or governmental or non-governmental organization. Evaluation will be based on a written project report related to the work completed during the Internship and on an assessment from the employer.

Prerequisite: Fourth-year Honours standing; and registration in the Internship Option of the Concentration in Law, Policy and Government.

Internship 35 hours a week.

Law 51.464 ★

Legal Aspects of the International Protection of Human Rights

The developing international law relating to the protection of human rights. General concepts, rules and institutions. Specific issues include self-determination, aboriginal rights, the refugee problem, and torture. The inherent problems and overall potential of international law.

Prerequisite: One of Law 51.353 ★, 51.353, 51.359 ★, 51.363 ★, or 51.363.

Lectures three hours a week.

Law 51.465 ★

Contemporary Issues in Public International Law

Topics vary from year to year and are announced in advance. May include transnational environmental issues; the international law of armed conflict, peacekeeping and neutrality; the law of international treaties and transnational agreements; state responsibility under international law. For 1999-2000, the topic will be Humanitarian Law and Armed Conflict.

Prerequisite: Law 51.363 (or, if Law 51.465 ★ is offered in the Winter term, concurrent registration in Law 51.363).

Seminars three hours a week.

Law 51.467 ★

Immigration and Refugee Law

Immigrants and refugees; demographics; Canadian, international and human rights law and policy. The Canadian Immigration Act. Legal and social problems including entry and removal, family reunion, citizenship, remedies, the rights of clandestine migrants;

settlement rights; non-discrimination; asylum; a nation's right to determine membership.

Prerequisite: Law 51.205.

Seminars three hours a week.

Law 51.471 ★

Special Topic in Criminal Justice and Social Policy

Examination of a selected topic in criminal justice and social policy. Topics to be announced well in advance of registration each year. This course is part of the Summer School in Criminal Justice and Social Policy and is offered by the Department of Law. (Also listed as Social Work 52.471 ★ and Sociology 53.471 ★.)

Prerequisite: Fourth-year Honours standing or permission of the Department.

Law 51.472 ★

Special Topic in Criminal Justice and Social Policy

Examination of a selected topic in criminal justice and social policy. Topics to be announced well in advance of registration each year. This course is part of the Summer School in Criminal Justice and Social Policy and is offered by the Department of Sociology and Anthropology. (Also listed as Social Work 52.472 ★ and Sociology 53.472 ★.)

Prerequisite: Fourth-year Honours standing or permission of the Department.

Law 51.473 ★

Special Topic in Criminal Justice and Social Policy

Examination of a selected topic in criminal justice and social policy. Topics to be announced well in advance of registration each year. This course is part of the Summer School in Criminal Justice and Social Policy and is offered by the School of Social Work. (Also listed as Social Work 52.473 ★ and Sociology 53.473 ★.)

Prerequisite: Fourth-year Honours standing or permission of the Department.

Law 51.480 ★

Environmental Regulation and Social Justice

The potential of environmental law to protect the environment and people while promoting opportunities for informed participation in environmental decision making by groups traditionally excluded from these processes; contemporary issues of social justice raised by legal regulation of the environment.

Precludes additional credit for Law 51.494C ★ (if taken between 1995-96, and 1997-98.).

Prerequisite: Fourth-year Honours standing.

Seminars three hours a week.

Law 51.481 ★

Risk and the Legal Process

Application of risk assessment and management in various legal arenas including insurance, liability and tort, litigation management, environmental protection, and sentencing and parole.

Precludes additional credit for Law 51.493C ★ (if taken in 1996-97 or 1997-98.).

Prerequisite: Fourth-year Honours standing.

Seminars three hours a week.

Law 51.486 ★

The Civilist Tradition

Study of several European legal systems based on Roman law. Development of Roman law, including Justinians corpus juris civilis. Reception of Roman law by various European legal systems. Comparative analysis of selected articles of the French, Austrian and German codes.

Prerequisites: Law 51.100 (or its equivalent) and another Law course or a Classics course.

Lectures three hours a week.

Law 51.490

Directed Studies

A reading or research course for selected students who wish to investigate a particular topic of interest. Available to Third- and Fourth-year students only.

Prerequisites: Written acceptance by a faculty adviser and permission of the Department.

Law 51.491 ★

Tutorial in Law

Members of the Department are prepared to give reading courses in selected fields. Students are encouraged to enquire from individual instructors or the Supervisor of Honours in what fields such reading courses are available.

Prerequisites: Written acceptance by a faculty member and permission of the Department.

Law 51.492 ★

Tutorial in Law

Members of the Department are prepared to give reading courses in selected fields. Students are encouraged to enquire from individual instructors or the Supervisor of Honours in what fields such reading courses are available.

Prerequisites: Written acceptance by a faculty member and permission of the Department.

Law 51.493 ★

Advanced Legal Topics

The topics of this course may vary from year to year, and are announced in advance of registration. For 1999-2000, the topic for Section A is to be announced. The topic for Section B is Family Conflict Resolution. The topic for Section C is to be announced.

Prerequisite: Fourth-year Honours standing.

Law 51.494 ★

Advanced Legal Topics

The topics of this course may vary from year to year and are announced well in advance of the period of registration.

For 1999-2000, the topic for Section A is Notorious Legal Battles in Context. The topic for Section B is to be announced. The topic for Section C is Corrections Law.

Prerequisite: Fourth-year Honours standing.

Graduate Courses Open to Undergraduate Students

Some graduate courses may also be open to interested Fourth-year students with permission of the Department.

Law Enforcement Studies (Public Affairs and Management)

Telephone: 520-2588
Fax: 520-6654

Academic Administration

Program Co-ordinator, K. Kelly

Management Committee Members, J.G. Bellamy • R.P. Saunders • B. Landry • A. Maslove • One student

General Information

This certificate program is designed for persons employed in the areas of law enforcement, national security or corrections, who wish to attend university courses. The program is offered in Day and Evening divisions. Candidates for the certificate are also encouraged to investigate undergraduate degree programs offered by the University. Courses taken for the certificate are normally creditable towards a Bachelor of Arts degree. Such a degree program will normally require at least 9.0 further credits in addition to those required for the certificate. Persons who wish to complete a Bachelor of Arts degree after taking the certificate must complete at least 5.0 of the credits required for a Bachelor of Arts degree after the awarding of the certificate, at least 3.0 of which must be in the area of specialization of the new program.

Admission Requirements

The basic admission requirement is the completion of the OSSD including six OACs, or the equivalent, with an overall average of 60 percent or better. Special consideration will be extended to other applicants under Mature Applicant regulations (see p. 35).

Candidates may be admitted with advanced standing, but must complete at least 4.0 credits for the certificate, including all core courses, at Carleton University.

Course Requirements

The following courses are required:

1. Law 51.204 (Introduction to Criminal Law in Context, prerequisite is C- or better in Law 51.100, or permission of the Department of Law);
2. Sociology 53.255 ★ (Sociology of Deviance, prerequisite C- or better in Sociology 53.100 or Anthropology 54.100 or Sociology-Anthropology 56.100) and 53.256 ★ (Police in Society);
3. Political Science 47.200 (Canadian Government and Politics, prerequisite is Political Science 47.100);

The candidate must, in addition, complete 3.0 credits, chosen in consultation with the Program Co-ordinator.

A candidate for the certificate must obtain a grade of C or better in at least one-half of the credits taken at Carleton University for the certificate.

Students are permitted eight attempts to complete the 6.0 credit program.

Linguistics and Applied Language Studies (Arts and Social Sciences)

Linguistics and Applied Language Studies Programs
249 Paterson Hall
Telephone: 520-2802

AIMESL Unit
215 Paterson Hall
Telephone: 520-6613

English as a Second Language Unit
215 Paterson Hall
Telephone: 520-6613

Academic Administration

Director, Ian Pringle
Assistant Director, Degree Programs, Lynne Young
Assistant Director, Language Teaching, Trudy O'Brien
Co-ordinator, English as a Second Language, Credit Programs, Catherine MacNeil

Co-ordinator, English as a Second Language, Intensive Programs, To be announced
Co-ordinator, Asian, Indigenous, Middle Eastern and Sign Language (AIMESL) Unit, George Chouchani
Co-ordinator, Language Testing Unit, Janna Fox
Co-ordinator, Writing Tutorial Service, Aviva Freedman

Teaching Staff

Professor Emeritus
William Cowan, B.A. (California), Ph.D. (Cornell)

Professors
Aviva K. Freedman, B.A. (McGill), M.A. (Columbia), Ph.D. (Montréal) • **C. Stanley Jones,** B.S. (Missouri Valley), M.A. (Washington at St. Louis) • **Ian W.V. Pringle,** M.A. (Auckland) • **J. Rakusan,** M.Ling., Lit. Sci. (Charles, Prague), Ph.D. (Ottawa) • **Hans-George Ruprecht,** D. Phil. (Saarbrücken), Diplôme E.H.E.S.S. (Paris) • **Helmut Zobl,** B.A., M.A. (Toronto), Ph.D. (Essen)

Associate Professors
Patricia Currie, B.A. (Queen's), Ph.D. (Lancaster) • **Ann S. Laubstein,** B.A. (Carleton), M.A., Ph.D. (Ottawa) • **Peter G. Medway,** B.A., M.A. (Oxford), Ph.D. (Leeds) • **Devon H. Woods,** B.A. (Carleton), M.Sc. (Edinburgh), Ph.D. (Utrecht) • **Robert J.H. Stainton,** B.A. (York), Ph.D. (Massachusetts Institute of Technology) • **Lynne Young,** B.A. (Carleton), M.A. (York), Ph.D. (Leeuwen)

Assistant Professors
Ellen Cray, B.A. (Illinois, New College), M.A. (Wisconsin) • **Richard Darville,** B.A. (Kansas), Ph.D. (British Columbia)

Lecturer
Trudy O'Brien, B.A., M.A. (Carleton)

Instructors
Natalia Artemeva, M.Eng. (Moscow Institute of Steel and Alloys), M.A. (Carleton) • **George E. Chouchani,** B.A. (American University, Cairo) • **Renata K.T. de Pourbaix,** B.A. (Trent) • **Janna Fox,** B.A. (Montana), M.A. (Carleton) • **Susan L. Logie,** B.A. (Carleton) • **Catherine MacNeil,** B.A. (Carleton) • **Yoko Azuma Prikryl,** B.A. (Keio), M.Ed. (Saskatchewan) • **Emi Sakamoto-Jog,** B.A., M.L.S. (McGill)

Adjunct Research Professors
Keith Christopher • **C. Douglas Ellis** • **Kumiko Murasugi**

Adjunct Professor
J. Yalden

General Information

The School of Linguistics and Applied Language Studies offers a number of programs:

- B.A. (Honours) Programs
- B.A. Programs
- Certificate in the Teaching of English as a Second Language (CTESL) (see p. 328)
- Mention: français (for more information, see p. 328)
- Master of Arts in Applied Language Studies (see *Graduate Calendar*)

The School also includes a number of other units:

- English as a Second Language for Credit
- AIMESL: Asian, Indigenous, Middle Eastern, and Sign Language Unit (see p. 333)
- Language Testing Unit
- Language Resource Unit
- Writing Tutorial Service

B.A. (Honours) Programs

The Honours degree in Linguistics and Applied Language Studies allows students to develop their interest in General Linguistics or in Applied Language Studies.

B.A. Programs

The B.A. program in Linguistics and Applied Language Studies allows students to acquire a general background in General Linguistics or in Applied Language Studies.

Both the B.A. (Honours) and B.A. programs offer a “Mention: français.” In addition to Linguistics and Applied Language Studies 29.100 or First-Year Seminar 01.126, there is a group of courses dealing with general linguistics, concentrating on the descriptive and/or historical analysis of language; another group of courses deals with language and its connections to other human studies.

Certificate in the Teaching of English as a Second Language (CTESL)

The Certificate in Teaching of English as a Second Language is a 5.0 credit program for those students who already have a degree or who have extensive experience in teaching, or are registered in an Honours undergraduate degree program at Carleton. The program includes both required courses and a range of complementary half-credit courses.

English as a Second Language for Credit

English as a Second Language for Credit offers a number of credit courses for students whose native language is not English.

AIMESL: Asian, Indigenous, Middle Eastern, and Sign Language Unit

The AIMESL Unit offers courses in a number of languages including: Japanese, Mandarin Chinese, Thai, Korean, Arabic, Indonesian/Malaysian, Hebrew, Vietnamese, Indigenous languages and American Sign Language. It also offers a course in English for Engineers as well as other specialized language-related courses.

Graduation Regulations

In order to graduate, students must fulfill all University graduation Regulations (see p. 48), all Faculty regulations including those relating to First-Year Seminars and Breadth requirements (see p. 63), and all Major regulations and requirements as set out below.

Honours Programs

Major in General Linguistics

This major focuses on general linguistics. The requirements are:

1. Linguistics and Applied Language Studies 29.100 or 01.126;
2. 29.201 ★, 29.203 ★, 29.302 ★, 29.304 ★;
3. 1.0 credit in Applied Language Studies from 29.223 ★, 29.241 ★, 29.273 ★, 29.274 ★, 29.275 ★, 29.276 ★, 29.340, 29.341 ★, 29.375 ★, 29.376 ★, 29.393 ★;
4. 1.0 credit chosen from 29.401 ★, 29.402 ★ or 29.409 ★;
5. 1.5 additional credits at the 400-level;
6. 3.0 additional credits in Linguistics and Applied Language Studies, chosen in consultation with the School;
7. A working knowledge of a language other than English, proficiency to be determined by successful completion of a university course in the language or by an oral or written test given by the School.

For a Combined Honours program the requirements are:

1. Linguistics and Applied Language Studies 29.100 or 01.126, 29.201 ★, 29.203 ★, 29.302 ★, 29.304 ★;
2. 1.0 credit from 29.401 ★, 29.402 ★ or 29.409 ★;

3. 2.0 additional credits in Linguistics and Applied Language Studies (including at least 0.5 credit at the 400-level);

4. A working knowledge of a language other than English, proficiency to be determined by successful completion of a university course in the language or by an oral or written test given by the School.

Major in Applied Language Studies

This major focuses on applied language studies. The requirements are:

1. Linguistics and Applied Language Studies 29.100 or 01.126;
2. 1.0 credit in general linguistics: 29.203 ★, and one of 29.201 ★, 29.302 ★, or 29.304 ★;
3. 2.0 credits in Applied Language Studies chosen from 29.223 ★, 29.241 ★, 29.273 ★, 29.274 ★, 29.275 ★, 29.276 ★, 29.340, 29.341 ★, 29.375 ★, 29.376 ★, 29.393 ★;
4. 1.0 credit chosen from 29.421 ★, 29.427 ★, 29.441 ★, 29.442 ★, 29.462 ★, 29.481 ★;
5. 1.5 additional credits at the 400-level;
6. 3.0 additional credits in Linguistics and Applied Language Studies, chosen in consultation with the School;
7. A working knowledge of a language other than English, proficiency to be determined by successful completion of a university course in the language or by an oral or written test given by the School.

For a Combined Honours program the requirements are:

1. 29.100 or 01.126, 29.203 ★, and one of 29.201 ★, 29.302 ★, or 09.304 ★;
2. 4.0 additional credits in Linguistics and Applied Language Studies (including at least 1.5 credits at the 400-level);
3. A working knowledge of a language other than English, proficiency to be determined by successful completion of a university course in the language or by an oral or written test given by the School.

B.A. Programs

Major in General Linguistics

This major focuses on general linguistics. The requirements are:

1. Linguistics and Applied Language Studies 29.100 or 01.126;
2. 29.201 ★, 29.203 ★, 29.302 ★, 29.304 ★;
3. 1.0 credit in Applied Language Studies from 29.223 ★, 29.241 ★, 29.273 ★, 29.274 ★, 29.275 ★, 29.276 ★, 29.340, 29.341 ★, 29.375 ★, 29.376 ★, 29.393 ★;
4. 2.5 additional credits in Linguistics and Applied Language Studies, chosen in consultation with the School;
5. A working knowledge of a language other than English, proficiency to be determined by successful completion of a university course in the language or by an oral or written test given by the School.

Major in Applied Language Studies

This major focuses on Applied Language Studies. The requirements are:

1. Linguistics and Applied Language Studies 29.100 or 01.126;
2. 1.0 credit in general linguistics: 29.203 ★, and one of 29.201 ★, 29.302 ★, or 29.304 ★;

3. 2.0 credits in Applied Language Studies from 29.223 ★, 29.241 ★, 29.273 ★, 29.274 ★, 29.275 ★, 29.276 ★, 29.340, 29.341 ★, 29.375 ★, 29.376 ★, 29.393 ★;
4. 2.5 additional credits from courses in Linguistics and Applied Language Studies, chosen in consultation with the School;
5. A working knowledge of a language other than English, proficiency to be determined by successful completion of a university course in the language or by an oral or written test given by the School.

Minor in Educational Linguistics

Students who are registered in degree programs other than Linguistics and Applied Language Studies may register for a Minor in Educational Linguistics. The Minor will be earned by completing 4.0 credits from the list below with a GPA of 6.5 or better:

4.0 credits, to be chosen from the following: 29.223 ★, 29.241 ★, 29.263 ★, 29.264 ★, 29.271 ★, 29.273 ★, 29.274 ★, 29.275 ★, 29.276 ★, 29.340, 29.341 ★, 29.361 ★, 29.375 ★, 29.376 ★, 29.427 ★, 29.442 ★, 29.462 ★.

Minor in Japanese Language

Students who are registered in degree programs may register for a Minor in Japanese Language. The Minor will be earned by completing 4.0 credits as specified below with a GPA of 6.5 or better: 23.120 (2.0 credits), 23.220, 23.320.

Mention: français

Students in the B.A. (Honours) or B.A. program in Linguistics may qualify for the notation "Mention: français" by fulfilling the requirements outlined below. Those wishing to pursue this path should consult with the School's "Mention: français" adviser.

Linguistics courses presented in fulfillment of the "Mention: français" requirements can double as courses to satisfy Linguistics B.A. (Honours) or B.A. requirements.

Students enrolling in courses at the University of Ottawa will do so through the University of Ottawa Exchange Program. To enrol in courses in French at another university, students must obtain a Letter of Permission. (See articles 3.10 and 3.12, p. 66.)

B.A. (Honours) and Combined B.A. (Honours) (4.0 credits)

To graduate with the notation "Mention: français" students must include in their program the following:

1. 1.0 credit in French language chosen in consultation with the Department of French, for perfecting the students' command of French.
2. 1.0 credit linked to the study of the heritage and culture of French Canada taught in French at Carleton or the University of Ottawa. At Carleton: French 20.372 ★, 20.383 ★; At the University of Ottawa: FRA 3799, LIN 2505, LIN 3502, LIN 3503.
3. 1.0 credit in the area of linguistics taught in French at Carleton, at the University of Ottawa or at another university. At Carleton, 1.0 credit chosen from French 20.380 ★, 20.381 ★, 20.382 ★, 20.480 ★, 20.481 ★, 20.482 ★, 20.483 ★, Linguistics and Applied Language Studies 29.397.
4. 1.0 credit at the 400-level in the area of linguistics taught in French at Carleton, at the University of Ottawa or at another university. At Carleton, 1.0 credit chosen from French 20.480 ★, 20.481 ★, 20.482 ★, 20.483 ★ (if not taken during the Third year), Linguistics and Applied Language Studies 29.397.

The focus of the tutorials (Linguistics 29.397 and 29.497) may be on any of the following topics: American Indian languages, sociolinguistique, bilinguisme, dialectologie, développement de la langue maternelle pendant les années scolaires, problèmes du bilinguisme scolaire, pragmatique, grammaire du texte, sémiotique,

sémiotique. All written work must be submitted in French.

5. Combined Honours students must meet the "Mention: français" requirements of both Honours disciplines.

B.A. Programs (3.0 credits)

To graduate with the notation "Mention: français" students must include in their program the following:

1. 1.0 credit in French language chosen in consultation with the Department of French, for perfecting the students' command of French.
2. 1.0 credit linked to the study of the heritage and culture of French Canada taught in French at Carleton or the University of Ottawa. At Carleton: French 20.372 ★, 20.383 ★; At the University of Ottawa: FRA 3799, LIN 2505, LIN 3502, LIN 3503.
3. 1.0 credit in the area of linguistics taught in French at Carleton, at the University of Ottawa or at another university. At Carleton, 1.0 credit chosen from French 20.380 ★, 20.381 ★, 20.382 ★, 20.480 ★, 20.481 ★, 20.482 ★, 20.483 ★, Linguistics and Applied Language Studies 29.397.

Requirement for Breadth, for students in B.A. or B.A.(Honours) degrees

Category for Breadth	Courses in this unit
The temporal dimension of human societies, analyzing times before the present era or societies other than our own	
The artifacts of the imagination in literature and/or other forms, or that addresses the life of the imagination and culture.	(29.)340
The understanding of social, technological and/or natural processes and the ways in which that understanding is obtained in science and social science.	All Linguistics and Applied Language courses not listed in any other category
Matters of human values, ethics and social responsibilities	

Certificate in the Teaching of English as a Second Language (CTESL)

To receive the Certificate in the Teaching of English as a Second Language, the requirements are:

1. Linguistics and Applied Language Studies 29.100 or First-Year Seminar 01.126; 29.425 and 29.426 taken concurrently; 29.462 ★; 29.481 ★.
2. 1.0 credit chosen from:
Linguistics 29.201 ★, 29.203 ★, 29.241 ★, 29.264 ★, 29.271 ★, 29.273 ★, 29.274 ★, 29.275 ★, 29.340, 29.361 ★, 29.375 ★, 29.376 ★, 29.421 ★, 29.427 ★, 29.482 ★, 29.496 ★, or any other course approved by the Supervisor of CTESL.

29.100 or 01.126 must be taken before or concurrently with all required courses.

A candidate for the Certificate must obtain a grade of C or better in all courses taken at Carleton University under the Certificate program. In addition, students in the CTESL program must be fluent in English, proficiency to be determined by an oral or written test given by the School.

Admission Requirements

1. Students may earn a Certificate as part of a B.A. (Honours) in any discipline.
2. Students may also seek admission to the Certificate program after having completed a first degree in another discipline.

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

First-Year Seminar in Linguistics and Applied Language Studies 01.123

Introduction to Academic Language and Culture

Language as it is related to disciplinary enquiry; the language and culture of a variety of disciplines. Intended to enhance students' abilities to understand and acquire the culture, language, and conventions of their own disciplines. Limited enrolment.

Precludes additional credit for Linguistics and Applied Language Studies 29.185 ★.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Lectures three hours a week.

First-Year Seminar in Linguistics and Applied Language Studies 01.124

Language and Social Identity

The creation and expression of social identities through language; gender, age, ethnic and social background. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Lectures three hours a week.

First-Year Seminar in Linguistics and Applied Language Studies 01.125

Language and Power

The role of language in maintaining and contesting power relations in domains such as the media, education, advertising, and politics. How meanings are made and exchanged through language in different situations. Limited enrolment.

Precludes additional credit for Linguistics and Applied Language Studies 29.275 ★.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Lectures three hours a week.

First-Year Seminar in Linguistics and Applied Language Studies 01.126

Intensive Introductory Linguistics

Language as the defining human characteristic. Universal and specific linguistic features in language and adults, children and second-language learners. Limited enrolment.

Precludes additional credit for Linguistics and Applied Language Studies 29.100.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Lectures three hours a week.

Linguistics and Applied Language Studies 29.100

Introduction to Linguistics

Elementary principles and methods of descriptive analysis of language; phonetics; phonology; morphology; syntax. Survey of other areas of linguistics: historical linguistics, sociolinguistics, psycholinguistics, semantics, applied linguistics.

Precludes additional credit for First-Year Seminar 01.126.

Lectures three hours a week.

Linguistics and Applied Language Studies 29.185

Academic Discourse and Culture

Language as it is related to disciplinary enquiry. Language and culture of a variety of disciplines. Intended to enhance students' abilities to understand and acquire the culture, discourse, and conventions of their own disciplines.

Precludes additional credit for First-Year Seminar in Linguistics and Applied Language Studies 01.123.

Lectures three hours a week.

Linguistics and Applied Language Studies 29.201 ★

Phonetics

Recognition, description, transcription and production of speech sounds; systems of transcription; the nature of the speech-producing mechanism; the acoustics of speech sounds. (Also listed as Anthropology 54.221 ★.)

Precludes additional credit for Linguistics and Applied Language Studies 29.301 ★.

Prerequisite: Linguistics and Applied Language Studies 29.100 or 01.126.

Lectures three hours per week.

Linguistics and Applied Language Studies 29.203 ★

Language Analysis

Direction and practice in the analysis of grammatical material, including both morphology and syntax. Models for the description of grammatical regularities. Course work consists principally of practical exercises. (Also listed as Anthropology 54.223 ★.)

Precludes additional credit for Linguistics and Applied Language Studies 29.303 ★.

Prerequisite: Linguistics and Applied Language Studies 29.100 or 01.126.

Lectures three hours a week.

Linguistics and Applied Language Studies 29.223 ★

Linguistic Theory and Second-Language Learning

A critical study of linguistic theory and description applied to second-language learning. Includes a brief consideration of similarities and differences in first- and second-language development, bilingualism and types of linguistic error and their significance.

Lectures three hours a week.

Linguistics and Applied Language Studies 29.241 ★

Language in Education

Insights from linguistics and applied language studies into the development of English as mother tongue during elementary and/or secondary education. Language, learning and cognitive development.

Precludes additional credit for Linguistics and Applied Language Studies 29.295 and English 18.295.

Lectures three hours a week.

Linguistics and Applied Language Studies 29.254 ★

Language and Communication

Some of the central topics in the study of language and communication as pursued by linguists and philosophers. Topics include: the nature of meaning; the connections between language, communication and cognition; language as a social activity. (Also listed as Philosophy 32.254 ★ and Mass Communication 27.254 ★.)

Precludes additional credit for Linguistics and Applied Language Studies 29.280 (27.280; 32.280).

Prerequisite: Second-year standing.

Lectures three hours a week.

Linguistics and Applied Language Studies 29.263 ★

Child Language

This course will look at the milestones associated with the development of grammatical, pragmatic and metalinguistic competence from birth to about age ten, and at the relative contributions of the environment, cognitive development and inborn knowledge to

this development.

Prerequisite: Linguistics and Applied Language Studies 29.100 or 01.126.

Lectures three hours per week.

Linguistics and Applied Language Studies 29.264 ★

Speech and Language Problems

An examination of the congenital, developmental and acquired disorders of language, speech and voice; prevalences, types, causes and effects; related research.

Lectures three hours a week.

Linguistics and Applied Language Studies 29.271 ★

Sociolinguistics

The place of language within society; bilingual and multilingual communities; language, social mobility and social stratification; sociolinguistic factors in language change.

Lectures three hours a week.

Linguistics and Applied Language Studies 29.273 ★

Gender and Language

A course that considers the influence of gender on language and the way in which language reflects society's view of gender. Topics covered include: gender differences in language use and in discourse, gender-bias in language, and the role of language in socializing for gender.

Prerequisite: Second-year standing.

Lectures three hours a week.

Linguistics and Applied Language Studies 29.274 ★

Bilingualism

The linguistic nature of bilingualism. The structure of bilingual societies and the relation between societal and individual bilingualism. The role of bilingualism in language education.

Prerequisite: Second-year standing.

Lectures three hours a week.

Linguistics and Applied Language Studies 29.275 ★

Language, Ideology and Power

How social conditions engender different linguistic choices. Attention to linguistic resources for expressing ideological beliefs and for maintaining and reinforcing power structures in institutional and social sites. (Also listed as Sociology/Anthropology 56.215 ★.)

Lectures three hours a week.

Linguistics and Applied Language Studies 29.276 ★

Conversational Analysis

Methods and theory for analysing ordinary talk. Differences between language in conversation and formal spoken and written language. The relation of conversational analysis to other approaches to studying language. The connection between conversational analysis and studies of interaction. (Also listed as Sociology/Anthropology 56.216 ★.)

Lectures three hours a week.

Linguistics and Applied Language Studies 29.302 ★

Phonology

The sound-systems of languages; methods for the analysis and description of phonological structure. The course concentrates on generative theory with comparisons to other theories. (Also listed as Anthropology 54.302 ★.)

Prerequisite: Linguistics and Applied Language Studies 29.201 ★.

Lectures three hours a week.

Linguistics and Applied Language Studies 29.304 ★

Grammatical Theory

Comparison of major current schools of linguistics. Theories of grammatical structure. The testing of grammatical hypotheses. Grammatical structure and meaning. Course work consists princi-

pally of lectures and readings. (Also listed as Anthropology 54.304 ★.)

Prerequisite: Linguistics and Applied Language Studies 29.203 ★.

Lectures three hours a week.

Linguistics and Applied Language Studies 29.309 ★

Topics in General Linguistics

Selected topics in general linguistics not ordinarily treated in the regular course program. Contents of the course vary from year to year.

Prerequisite: Linguistics and Applied Language Studies 29.100 (or 01.126) or permission of the School.

Lectures and discussion three hours per week.

Linguistics and Applied Language Studies 29.311 ★

Historical Linguistics

Principles and methods of the historical analysis of languages; the comparative method; internal reconstruction; sound change; rule change; the philological method; problems in historical analysis.

Precludes additional credit for Linguistics 29.211 ★.

Prerequisite: Linguistics and Applied Language Studies 29.100 or 01.126.

Lectures three hours a week.

Linguistics and Applied Language Studies 29.340

Writing: Theory and Practice

A study of the process of writing in theory and practice.

Readings and discussions focus on the composing process; the development of writing abilities from the elementary years to maturity; the interrelationships between thinking and writing; strategies for encouraging growth in writing. (Also listed as English 18.397.)

Precludes additional credit for Linguistics and Applied Language Studies 29.247 (18.297) and 29.297.

Prerequisite: Second-year standing or enrolment in either the Certificate Program in English Language and Composition or the CTESL program.

Linguistics and Applied Language Studies 29.341 ★

Language and Work

Written and spoken language of the workplace. How people participate through language in generating ideas, solving problems, carrying out tasks and creating, maintaining, modifying and subverting social relations in workplace contexts. Students collect and analyse examples of workplace discourse.

Precludes additional credit for Linguistics 29.392 ★ (if taken in 1994-95).

Lectures three hours a week.

Linguistics and Applied Language Studies 29.354 ★

Pragmatics

The theoretical study of language use as pursued by linguists and philosophers. Topics include: conversational implicature; deixis; the semantics-pragmatics boundary; speaker's reference; speech acts. (Also listed as Mass Communication 27.354 ★ and Philosophy 32.354 ★.)

Precludes additional credit for Linguistics and Applied Language Studies 29.280, (27.280, 32.280)

Prerequisite: Second-year standing or at least 0.5 credit in Philosophy or Linguistics and Applied Language Studies.

Lectures three hours a week.

Linguistics and Applied Language Studies 29.356 ★

Semantics

Perspectives on the semantic structure of language. The study of meaning, with special emphasis on lexical and grammatical issues - including sentence and text meaning, as well as issues about reference. (Also listed as Philosophy 32.356 ★.)

Precludes additional credit for Linguistics and Applied Language Studies 29.232 ★ and Philosophy 32.232 ★.

Prerequisite: Linguistics and Applied Language Studies 29.203 ★, Mass Communication 27.254 ★, Linguistics and Applied Language Studies 29.254 ★, Philosophy 32.254 ★, or Philosophy 32.201 ★. Lectures three hours a week.

Linguistics and Applied Language Studies 29.361 ★

Psycholinguistics

Language performance and language use; the production and perception of language; psychological processes involved in speech performance; the relevance of these questions to linguistic theory. Precludes additional credit for Linguistics and Applied Language Studies 29.261 ★.

Prerequisite: Linguistics and Applied Language Studies 29.100 or 01.126.

Lectures three hours a week.

Linguistics and Applied Language Studies 29.375 ★

Adult Literacy

The extent and social contexts of restricted literacy in Canadian society; approaches to and debates surrounding the teaching and learning of adult literacy.

Precludes additional credit for Linguistics 29.496 ★ (if taken in 1994-95 or 1995-96).

Prerequisite: Third-year standing in Linguistics and Applied Language Studies or enrolment in the CTESL program.

Lectures three hours a week.

Linguistics and Applied Language Studies 29.376 ★

Discourse Analysis

Principles of and studies in discourse analysis, including both conversational and textual/documentary analysis. The major focus is on language use in structuring social relationships.

Precludes additional credit for Linguistics 29.423 ★

Prerequisite: Third-year standing in Linguistics and Applied Language Studies or enrolment in the CTESL program.

Lectures three hours a week.

Linguistics and Applied Language Studies 29.390

Independent Study

Research under the supervision of a member of the School. Normally available only to Third- and Fourth-year students in Linguistics and Applied Language Studies.

Prerequisite: Permission of the School.

Linguistics and Applied Language Studies 29.391 ★

Independent Study

Research under the supervision of a member of the School. Normally available only to Third- and Fourth-year students in Linguistics and Applied Language Studies.

Prerequisite: Permission of the School.

Linguistics and Applied Language Studies 29.393 ★

Special Topics in Applied Language Studies

Selected topics in Applied Language Studies not ordinarily treated in the regular course program. Contents of this course vary from year to year.

Prerequisite: Linguistics and Applied Language Studies 29.100 or First-Year Seminar 01.126, or permission of the School.

Lectures and discussion three hours per week.

Linguistics and Applied Language Studies 29.397

Études dirigées

Lectures ou recherche et travaux écrits dirigés par un membre du département. Les projets de recherche peuvent être organisés soit comme tutorial pour un(e) seul(e) étudiant(e) soit comme séminaire pour un groupe d'étudiants.

For Third-year Linguistics and Applied Language Studies students of "Mention: français" only.

Prerequisite: Permission of the School.

Linguistics and Applied Language Studies 29.401 ★

Advanced Phonology

A continuation of Linguistics and Applied Language Studies 29.302 ★. Among topics covered: the methodological problems of phonology, the problems of markedness and natural rules, ordering, abstractness, and other current theoretical developments.

Prerequisite: Linguistics and Applied Language Studies 29.302 ★

or

permission of the School.

Lectures three hours a week.

Linguistics and Applied Language Studies 29.402 ★

Advanced Grammar

A continuation of Linguistics and Applied Language Studies 29.304 ★. Among topics covered: global rules, clause movement, constraints, trace theory and other current developments in syntactic analysis.

Prerequisite: Linguistics and Applied Language Studies 29.304 ★

or

permission of the School.

Lectures three hours a week.

Linguistics and Applied Language Studies 29.403 ★

Philosophy of Language

(Also listed as Philosophy 32.401 ★).

Prerequisite: Fourth-year Honours standing in Linguistics and Applied Language Studies or Philosophy or permission of either the School or the Department of Philosophy.

Linguistics and Applied Language Studies 29.409 ★

Topics in General Linguistics

A course devoted to an examination of a topic or more specialized area in linguistics or language study. This course may be taken more than once. Prerequisite: Third- or Fourth-year standing in Linguistics and Applied Language Studies or permission of the School.

Lectures three hours a week.

Linguistics and Applied Language Studies 29.421 ★

Language Testing

The principles of test construction as applied to testing language proficiency, achievement and aptitude. Structural, notional, discrete point and integrative tests are covered. Students are expected to create, analyse and evaluate language tests.

Prerequisite: Third-year standing in Linguistics and Applied Language Studies, or enrolment in the CTESL program.

Lectures three hours a week.

Linguistics and Applied Language Studies 29.425

Teaching English as a Second Language: Methodology

Classification of classroom teaching methods and materials; adaptation of teaching materials for particular situations; creation of teaching materials; teaching techniques and strategies.

Prerequisite: Third-year standing in Linguistics and Applied Language Studies, or enrolment in the CTESL program.

Lectures three hours a week.

Linguistics and Applied Language Studies 29.426

Practicum in Teaching English as a Second Language: Experience in an ESL Teaching Situation

Integrates the academic dimension of the program with practical work. Observation in ESL classes and possible assistance with teaching materials or classes. Graded Sat or Uns and normally taken concurrently with Linguistics and Applied Language Studies 29.425. Prerequisites: Third-year standing in Linguistics and Applied Language Studies, or enrolment in the CTESL program.

Linguistics and Applied Language Studies 29.427 ★

ESL Literacy

The nature of everyday literacy and literacy skills. Analyzing the structure of everyday literacy texts and demands. Issues in literacy

for second-language learners.

Prerequisite: Third-year standing in Linguistics and Applied Language Studies, or enrolment in the CTESL program.

Lectures three hours a week.

Linguistics and Applied Language Studies 29.441 ★

Rhetoric and Argument in the Human, Social and Natural Sciences

How rhetorical considerations shape the construction of arguments within disciplinary communities. How disciplinary and socio-historical conditions shape scientific communities' criteria for what will be accepted as persuasive. Reflexive work analysing students' own fields of inquiry. Also offered at the graduate level, with additional or different requirements, as Applied Language Studies 29.541 for which additional credit is precluded.

Precludes additional credit for Linguistics and Applied Language Studies 29.495 and English 18.495.

Prerequisite: Third-year standing.

Lectures three hours a week.

Linguistics and Applied Language Studies 29.442 ★

Learning Across the Disciplines: A Research Practicum

Theory about and research into the role of language in learning and pedagogic situations which optimize that relationship. Students perform teacher-research related to their teaching, within the context of the theory presented. Also offered at the graduate level, with additional or different requirements, as Applied Language Studies 29.542 for which additional credit is precluded.

Prerequisite: Third-year standing.

Lectures three hours a week.

Linguistics and Applied Language Studies 29.462 ★

Second-Language Acquisition

Current models of second-language acquisition and learning with an emphasis on empirical studies. Universals of second-language acquisition.

Prerequisite: Third-year standing in Linguistics and Applied Language Studies, or enrolment in the CTESL program.

Lectures three hours a week.

Linguistics and Applied Language Studies 29.481 ★

Major Structures of English

This course is intended to familiarize students with the structure of the English language, highlighting important contrasts between English and other languages as well as grammatical difficulties for ESL learners.

Precludes additional credit for Linguistics and Applied Language Studies 29.485.

Prerequisites: Enrolment in the CTESL program or Fourth-year standing and Linguistics and Applied Language Studies 29.100 or 01.126.

Lectures three hours a week.

Linguistics and Applied Language Studies 29.482 ★

Language Contact and Language Spread

This course will consider the development and spread of creoles and pidgins, introduce principles of language policy and planning, and analyze the emergence of New Englishes.

Precludes additional credit for Linguistics and Applied Language Studies 29.485.

Prerequisites: Enrolment in the CTESL program or Fourth-year standing and Linguistics and Applied Language Studies 29.100 or 01.126.

Lectures and discussion three hours a week.

Linguistics and Applied Language Studies 29.490

Tutorial in Linguistics

Permits Fourth-year Honours students to pursue their interests in a selected area of linguistics and applied language studies.

Prerequisite: Permission of the School.

Linguistics and Applied Language Studies 29.491 ★

Tutorial in Linguistics

Permits Fourth-year Honours students to pursue their interests in a selected area of linguistics and applied language studies.

Prerequisite: Permission of the School.

Linguistics and Applied Language Studies 29.496 ★

Selected Topics in Applied Language Studies

Selected topics in applied language studies. Contents of this course vary from year to year.

Prerequisite: Third- or Fourth-year standing or enrolment in the CTESL program.

Lectures three hours a week.

Linguistics and Applied Language Studies 29.497

Études dirigées

Études spécialisées en linguistique. Préparation d'un travail écrit ou d'une mémoire sur un sujet choisi par l'étudiant(e) en collaboration avec le directeur du tutorial et approuvé par le l'école.

For Fourth-year Linguistics and Applied Language Studies students of "Mention: français" only.

Prerequisite: Permission of the School.

Linguistics and Applied Language Studies 29.499

Honours Essay

Subject selected in consultation with the department and carried out under the direction of a faculty supervisor. Scheduled tutorials with supervisor are required.

Prerequisites: Fourth-year standing in Linguistics and Applied Language Studies, a GPA of 9.0 or better, and permission of the School.

Tutorial hours arranged.

English as a Second Language Unit

General Information

The Credit and Non-Credit English as a Second Language (ESL) Units offer a number of types of courses for students for whom English is not the native language, including credit courses, and non-credit courses. The non-credit courses are offered on a full-time basis (as the Intensive Courses) or on a part-time basis (individual courses related to specific language needs). In addition, the ESL Units develop and carry out specialized courses for client groups based on their academic or professional needs including the non-credit Diploma in English as a Foreign Language: English Language and Methods for International Teachers, and the non-credit Diploma in English for Business Communication.

The ESL Units also engage in research activities related to analysis of students' language needs, development of methodologies and materials for teaching, and development of methodologies and materials for self-directed learning, and assessment of language activities through testing.

Credit Course Information

The courses are designed to meet the needs of students who are qualified for admission to any faculty but whose native language is not English, and whose scores on the Canadian Academic English Language (CAEL) Assessment or other tests recognized by the University indicate they would encounter serious difficulties in a full academic program. No student who has native or native-like command of English is permitted to take any of these courses.

The aim of these courses is to train students for university work. E.S.L. 21.130 is specifically for Canadian residents and citizens who have had little or no previous experience with academic English. The focus for the Intermediate English (E.S.L. 21.150) and Advanced English (E.S.L. 21.190) is on listening to lectures and ex-

tended discourse, note-taking, writing essays and papers and participating in group seminar work. E.S.L. 21.195 is a similar course but is concerned specifically to address the needs of students in the Faculty of Engineering. The focus in Advanced Writing (E.S.L. 21.196 ★) is specifically related to developing skill in preparing, writing, revising and editing papers and reports for academic and professional purposes.

Placement in these courses is determined by the Canadian Academic English Language (CAEL) Assessment. No challenges for credit can be made for credit in E.S.L. The number of E.S.L. credits that may count toward a degree varies by faculty: a maximum of 1.0 credit (at the advanced level only) may count toward a student's degree in Engineering; a maximum of 2.0 credits may count toward a degree in the Faculties of Public Affairs and Management and Arts and Social Sciences; a maximum of 3.0 credits may count toward a degree in the Faculty of Science and the School of Computer Science.

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Linguistics and Applied Language Studies 21.130

Introductory English as a Second Language for Academic Purposes

Skills and strategies in ESL for students with little or no experience with academic English. General proficiency development. Integrated language skills and strategies for academic success at university.

Prerequisite: Placement by the Canadian Academic English Language Assessment.

Not open to visa students.

Nine hours a week (one term).

Linguistics and Applied Language Studies 21.150

Intermediate English as a Second Language for Academic Purposes

Skills and strategies in ESL for students with basic grammatical and oral competence but limited experience with academic English. Focus on reading, listening and writing. Introduction to research skills.

Prerequisite: Linguistics and Applied Language Studies 21.130 or placement by the Canadian Academic English Language Assessment.

Six hours a week (one term).

Linguistics and Applied Language Studies 21.190

Advanced English as a Second Language for Academic Purposes

Development of research and analytic skills, primarily through reading and writing of academically-oriented texts.

Prerequisite: Grade of C or better in Linguistics and Applied Language Studies 21.150 or placement by the Canadian Academic English Language Assessment.

Six hours a week (one term).

Linguistics and Applied Language Studies 21.195

Advanced English as a Second Language for Engineering Students

Development of technical communication skills specific to Engineering and Industrial Design: reports, design projects, oral presentations.

Prerequisite: Grade of C or better in Linguistics and Applied Language Studies 21.150 or placement by the Canadian Academic English Language Assessment.

Three hours a week (two terms).

Linguistics and Applied Language Studies 21.196 ★

Advanced Writing for English as a Second Language

Strategies for writing academic papers and professional text.

Three hours a week (one term).

AIMESL - Asian, Indigenous, Middle Eastern and Sign Language

General Information

In addition to E.S.L. courses, the School of Linguistics and Applied Language Studies assumes the responsibility for teaching the University's credit courses in Mandarin Chinese, Thai, Japanese, Korean, Arabic, Indonesian/Malaysian, Hebrew, Vietnamese, Indigenous languages and American Sign Language. Some of these are intensive courses, requiring eight hours of class-time per week in addition to regular laboratory and other out-of-class assignments.

The Unit also includes a course that addresses the discipline specific communication needs of Engineering students.

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Linguistics and Applied Language Studies 23.100 ★

Communication Skills for Engineering Students

Development of students' competence in written and oral communication in engineering. Focus on professional written documents (process descriptions, proposals, reports, engineering literature reviews and responses); written responses to engineering communications; related oral work.

Precludes additional credit and weight for Engineering 91.200.

Lectures three hours a week.

Linguistics and Applied Language Studies 23.110

Intensive Introductory Mandarin (2.0 credits)

For students with little or no knowledge of Mandarin. Oral skills; basic reading and writing skills. Placement test for non-literate speakers of other Chinese language.

Not open to students already literate in any Chinese language.

Eight hours a week.

Linguistics and Applied Language Studies 23.120

Intensive Introductory Japanese (2.0 credits)

For students with no knowledge of Japanese. Oral skills; basic reading and writing skills.

Precludes additional credit for Linguistics and Applied Language Studies 23.121.

Eight hours a week.

Linguistics and Applied Language Studies 23.121

Low Intermediate Japanese

Continuation of the study of Japanese to reach by the end of the course a level of proficiency comparable to that of students who complete Linguistics and Applied Language Studies 23.120. All skills; emphasis on the development of reading and writing. Precludes additional credit for Linguistics and Applied Language Studies 23.120.

Prerequisites: At least one year of high school Japanese, or equivalent ability.

Eight hours a week (one term).

Linguistics and Applied Language Studies 23.220

Intermediate Japanese

Continuation of the study of Japanese to reach a more advanced level of ability in a range of situations. Equal emphasis on oral and written language.

Prerequisite: Linguistics and Applied Language Studies 23.120 or equivalent, or a minimum of two years of Japanese as a second language at secondary school. Students must have an ability to read and write both hiragana and katakana and have some knowledge of kanji characters.

Three hours a week.

Linguistics and Applied Language Studies 23.320

Advanced Japanese

Continuation of the study of Japanese to reach a more advanced level, including ability to handle authentic materials and also primary texts required for academic studies.

Prerequisite: Linguistics and Applied Language Studies 23.220 or equivalent.

Three hours a week.

Linguistics and Applied Language Studies 23.125

Intensive Introductory Korean (2.0 credits)

For students with no knowledge of Korean. Oral skills; basic reading and writing and skills.

Precludes additional credit for Linguistics and Applied Language Studies 23.126.

Eight hours a week.

Linguistics and Applied Language Studies 23.126

Low Intermediate Korean

Continuation of the study of Korean to reach by the end of the year a comparable level of proficiency to students who complete Linguistics and Applied Language Studies 23.125. All skills; emphasis on the development of reading and writing.

Precludes additional credit for Linguistics and Applied Language Studies 23.125.

Prerequisite: At least one year of high school Korean, or equivalent ability.

Four hours a week in two terms, or eight hours a week in one term.

Linguistics and Applied Language Studies 23.130

Intensive Introductory Arabic (2.0 credits)

For students with little or no knowledge of Arabic. Intermediate spoken proficiency in one dialect of Modern Standard Arabic. Writing and composition.

Eight hours a week.

Linguistics and Applied Language Studies 23.190

Introductory Study of an Indigenous Language

An introduction to the study of an indigenous language. Language for 1999-2000: Ojibwe.

Four hours a week.

Linguistics and Applied Language Studies 23.191

Introduction to American Sign Language

For students with little or no knowledge of the language or culture of deaf people. Basic communicative competence in American Sign Language. Anthropological, sociolinguistic, and sociocultural aspects of deaf culture.

Three hours a week.

Language Testing Unit

215 Paterson Hall

Telephone: 520-6612

Testing Co-ordinator: Janna Fox

For students who are admitted to Carleton with an English language requirement, or for non-native speakers of English who wish to take courses in English as a Second Language, the Language Testing Unit of the School of Linguistics and Applied Language Studies prepares and administers the Canadian Academic English Language (CAEL) Assessment and other placement and proficiency tests in English as a Second Language. The Language Testing Unit also conducts research and development activities in language testing, and offers a consultancy service on language testing both within the University and outside.

Language Resource Unit

The Language Resource Unit houses the language laboratory and the language-laboratory-by-telephone system. It holds audio, video and print materials for language learning. It has facilities for specialized courses in many foreign languages which can meet special language requirements of particular groups.

Writing Tutorial Service

The Writing Tutorial Service offers a flexible and multi-faceted approach to the teaching of writing at the University. The program consists of individualized tutorials, supplementary workshops on style, minicourses on the principles of academic writing in general, and seminars on the finer points of discipline-specific writing (such as the writing of law essays and examinations). In addition, the service is regularly called on to deal with special writing problems arising in specific courses or disciplines by designing individual ancillary programs in response to, and in consultation with, the instructors in those disciplines. The service also sponsors and conducts research on the acquisition, development, and improvement of writing abilities in the university context.

Carleton University Writing Consultants

Carleton University Writing Consultants is an extension of the Writing Tutorial Service that provides teams of consultants to diagnose writing problems in the workplace, analyze patterns of written communication in the workplace, and provide appropriate in-house writing instruction, usually on an individualized tutorial basis.

Mass Communication

(Public Affairs and Management)

310 St. Patrick's Building
Telephone: 520-7408
Fax: 520-6690

Academic Administration

Associate Director, School of Journalism and Communication, Paul Attallah

Supervisor of Graduate Studies, Vincent Mosco

Bachelor of Arts in Mass Communication

The School of Journalism and Communication offers B.A. (Honours) and B.A. undergraduate programs in Mass Communication. Candidates for the Honours program are required to take a minimum of 20.0 credits and those in the B.A. program a minimum of 15.0 credits. The Mass Communication programs are provided for students with broad interests in mass communication in contemporary society who do not intend to pursue careers as professional journalists. The Honours degree is designed for students who intend to do graduate work in communication or a related field.

Graduate Program

The School of Journalism and Communication offers studies leading to the degrees of Master of Arts and Ph.D. in Communication. For further details consult the Graduate Studies and Research Calendar.

Graduation Regulations

In order to graduate, students must fulfill all University graduation regulations (see p. 48), all Faculty regulations including those relating to First-Year Seminars and Breadth requirements (see p. 63), in addition to all regulations and requirements of the School of Journalism and Communication as set out below.

Admission and Continuation Requirements

Admission and continuation requirements in the B.A., B.A. (Honours), Combined B.A. (Honours) and Minor are those set by the Division of Arts and Social Sciences. Admission to Second year will be guaranteed only to students who complete 5.0 credits in First year, achieve a grade of B- or better in Mass Communication 27.111 or 01.127 and also achieve a CI of 7.00. The CI is calculated by dividing the total grade points accumulated over all attempts by the total number of attempts. The calculation is carried to two decimal places without rounding. For further information on calculation of the CI, see p. 72.

The School also maintains a number of places in Second year for students who wish to transfer from Carleton University or elsewhere. These spaces are limited and it may not be possible to grant admission to all applicants. Admission will therefore be on a selective basis with preference given to those candidates who show the highest promise of success. Normally, offers are made to students with an overall GPA of 10.0 or better.

Honours Program

A candidate for a B.A. (Honours) in Mass Communication requires 9.0 credits in Mass Communication. The requirements are:

1. Mass Communication 27.111 or 01.127, 27.201, 27.211, 27.311;
2. 2.0 credits chosen from Mass Communication 27.230★, 27.232★,

27.251★, 27.254★, 27.290, 27.300, 27.305★, 27.306★, 27.342★, 27.343★, 27.346★, 27.348★, 27.352★, 27.354★, 27.355★, 27.357★;

3. 3.0 credits chosen from Mass Communication 27.400★, 27.402★, 27.410★, 27.412★, 27.420★, 27.435★, 27.450★, 27.451★, 27.497;

4. 11.0 elective credits.

Recommended sequence for B.A. (Honours) in Mass Communication

First Year

Mass Communication 27.111 or 01.127;
4.0 elective credits.

Second Year

Mass Communication 27.201, 27.211;
3.0 elective credits.

Third Year

Mass Communication 27.311;
2.0 credits chosen from Mass Communication 27.230★, 27.232★, 27.251★, 27.254★, 27.290, 27.300, 27.305★, 27.306★, 27.342★, 27.343★, 27.346★, 27.348★, 27.352★, 27.354★, 27.355★, 27.357★;
2.0 elective credits.

Fourth Year

3.0 credits chosen from Mass Communication 27.400★, 27.402★, 27.410★, 27.412★, 27.420★, 27.435★, 27.450★, 27.451★, 27.497;
2.0 elective credits.

Combined Honours

Students taking Combined B.A. (Honours) in Mass Communication and another discipline are required to take the following credits:

1. Mass Communication 27.111 or 01.127, 27.201, 27.211, 27.311;
2. 1.0 additional credit at the 200- or 300-level in Mass Communication;
3. 2.0 credits chosen from Mass Communication 27.400★, 27.402★, 27.410★, 27.412★, 27.420★, 27.435★, 27.450★, 27.451★, 27.497.

Combined Honours in Journalism and Mass Communication

Course requirements are:

1. Mass Communication 27.201, 27.211, 27.311, and 2.0 credits chosen from Mass Communication 27.400★, 27.402★, 27.410★, 27.412★, 27.420★, 27.435★, 27.450★, 27.451★, 27.497;
2. 1.0 French language credit. Acceptable 100-level French courses are any of French 20.107, 20.145, and 20.160 or another French language credit approved by the School;
3. 1.0 approved credit in Canadian history. (Students who expect to practise journalism in another country may be advised to choose a different history course and must seek permission to do so from the Supervisor of Undergraduate Studies, Journalism.);

4. Approved options to make up a program total of 20.0 credits (20.5 credits if admitted prior to 1995-96).

B.A. Program

The requirements for a B.A. program in Mass Communication include 6.0 credits in Mass Communication:

1. Mass Communication 27.111 or 01.127, 27.201, 27.211, 27.311;
2. 2.0 credits chosen from Mass Communication 27.230★, 27.232★, 27.251★, 27.254★, 27.290, 27.300, 27.305★, 27.306★, 27.342★, 27.343★, 27.346★, 27.348★, 27.352★, 27.354★, 27.355★, 27.357★;
3. 9.0 elective credits.

Minor in Mass Communication

Students majoring in another discipline in the B.A. degree or the B.A. (Honours), may take a Minor in Mass Communication. 4.0 credits are required:

1. Mass Communication 27.111 or First-Year Seminar 01.127;
2. 27.211 and 27.311;
3. 1.0 additional credit in Mass Communication at the 200- or 300-level

Requirement for Breadth, for students in B.A. or B.A.(Honours) degrees

Category for Breadth	Courses in this unit
The temporal dimension of human societies, analyzing times before the present era or societies other than our own	
The artifacts of the imagination in literature and/or other forms, or that addresses the life of the imagination and culture.	
The understanding of social, technological and/or natural processes and the ways in which that understanding is obtained in science and social science.	All Mass Communication courses
Matters of human values, ethics and social responsibilities	

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

First-Year Seminar in Mass Communication 01.127

Introduction to Mass Communication

The emergence of mass communication studies in the 20th century; the major incidents and events which shaped our views of and attitudes towards communication and the media. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Lectures three hours a week.

Mass Communication 27.111

Introduction to Mass Communication

Examines major reasons for the emergence of communication

studies in the 20th century. Emphasis on history and structure of mass media, their relationship to social and cultural change, and basic issues of communication and cultural policy. Lectures and discussion groups three hours a week.

Prerequisite: Additional credit for First-Year Seminar 01.127.

Mass Communication 27.201

Communication Research

Introduction to quantitative and qualitative methods of communication research: statistical and computer analysis, field research, policy and document analysis, historical/archival research.

Prerequisites: Mass Communication 27.111 or First-Year Seminar 01.127, or Journalism 28.100 as well as B.A. (Honours) or B.A. standing in Mass Communication, or Public Affairs and Policy Management 58.100 and registration in the Strategic Public Opinion and Policy Analysis specialization of the Bachelor of Public Affairs and Policy Management, or permission of the School.

Lecture two hours a week, laboratory one hour a week.

Mass Communication 27.211

Communication and Modern Society

Examination of the historical development and current operations of diverse communication institutions in relation to the larger social structure, with emphasis on Canadian society.

Prerequisites: Mass Communication 27.111 or First-Year Seminar 01.127 as well as second year standing in Mass Communication, or Public Affairs and Policy Management 58.100 and registration in the Communication Information Technology Policy specialization of the Bachelor of Public Affairs and Policy Management, or permission of the School.

Lectures and discussion three hours a week.

Mass Communication 27.230★

Communication Policy: Theory and Foundations

Introduction to theoretical perspectives on the role of communication and cultural policy in modern society. Examination of the different approaches to the role of the State in the production and legitimization of communication and cultural policy.

Prerequisites: Mass Communication 27.111 or First-Year Seminar 01.127, or Journalism 28.100 as well as B.A. (Honours) or B.A. standing in Mass Communication, or Public Affairs and Policy Management 58.100 and registration in the Communication Information Technology Policy specialization of the Bachelor of Public Affairs and Policy Management, or permission of the School.

Lecture three hours a week.

Mass Communication 27.232★

Communication Policy: Institutions and Practices

Examination of selected policy practices in the domains of communication and culture. Policies developed in these domains are related to the institutions, agencies, actors and social interests that shape their development in Canada and elsewhere.

Prerequisites: Mass Communication 27.111 or First-Year Seminar 01.127, or Journalism 28.100 as well as B.A. (Honours) or B.A. standing in Mass Communication, or Public Affairs and Policy Management 58.100 and registration in the Communication Information Technology Policy specialization of the Bachelor of Public Affairs and Policy Management, or permission of the School.

Lecture three hours a week.

Mass Communication 27.251★

Communications Law I

A survey of laws that affect the Canadian media. Specific areas include the development of freedom of expression, the Charter of Rights and Freedoms, and statutory and common law limitations on freedoms of the press, including publication bans, libel and contempt of court. (Also listed as Journalism 28.251★.)

Prerequisite: Additional credit for Mass Communication 27.351★, Journalism 28.351★ or Law 51.351★.

Prerequisite: Mass Communication 27.111 or First-Year Seminar 01.127 or 28.100, or Public Affairs and Policy Management 58.100

and registration in the Communication Information Technology Policy specialization of the Bachelor of Public Affairs and Policy Management, or permission of the School.
Lectures and discussion three hours a week.

Mass Communication 27.254 ★

Language and Communication

Some of the central topics in the study of language and communication as pursued by linguists and philosophers. Topics include: the nature of meaning; the connections between language, communication and cognition; language as a social activity. (Also listed as Linguistics and Applied Language Studies 29.254 ★ and Philosophy 32.254 ★.)

Precludes additional credit for Linguistics 29.280, Mass Communication 27.280 and Philosophy 32.280.

Prerequisite: Second-year standing.

Lectures three hours a week.

Mass Communication 27.290

Truth and Propaganda

Ancient and modern techniques of persuasion from analytical, ethical and jurisprudential perspectives. Objectivity and bias, advertising and public relations ethics, the viability of democracy in the light of pressures on and within the modern mass media. (Also listed as Philosophy 32.290.)

Prerequisite: At least 0.5 credit in Philosophy or Second-year standing.

Lectures and discussion three hours a week.

Mass Communication 27.300

Survey Research Applications in Public Affairs

A course which involves students in all phases of survey research as it relates to public affairs. Emphasis will be placed on methodological concerns. Students will be involved in the design and implementation of actual public affairs survey research projects or related research.

Prerequisites: Mass Communication 27.201 and Third-year standing in Mass Communication, or Political Science 47.270 and registration in the Strategic Public Opinion and Policy Analysis specialization within the Bachelor of Public Affairs and Policy Management, or permission of the School.

Lecture three hours per week including workshops.

Mass Communication 27.305 ★

International Media Systems

Examination of the flow of global communication and information and their impact on our views of the world. Attention to the relationship between Canadian media and regional and international media institutions and systems. (Also listed as Journalism 28.305 ★.)

Prerequisite: Mass Communication 27.211 as well as Honours or B.A. standing in Mass Communication, or Third- or Fourth-year B.J.(Hons) standing, or Public Affairs and Policy Management 58.200 and registration in the Communication Information Technology Policy specialization of the Bachelor of Public Affairs and Policy Management, or permission of the School.

Mass Communication 27.306 ★

Comparative Media Studies

The comparative study of one or more of media content, effects, organization, operation, and criticism, and related theoretical perspectives. (Also listed as Journalism 28.306 ★.)

Prerequisite: Mass Communication 27.211 as well as Honours or B.A. standing in Mass Communication, or Third- or Fourth-year B.J.(Hons) standing, or Public Affairs and Policy Management 58.200 and registration in the Communication Information Technology Policy specialization of the Bachelor of Public Affairs and Policy Management, or permission of the School.

Mass Communication 27.311

Advanced Study of the Mass Media

An examination of the philosophical and theoretical foundations of mass communication studies. The course is an analysis of the

content of selected theories with a view to assessing the contributions they make to the understanding of mass communication. Prerequisites: Mass Communication 27.211 and Honours or B.A. standing in Mass Communication or permission of the School. Lecture and discussion groups three hours a week.

Mass Communication 27.342 ★

On Television

This course examines the television medium as it was formed historically, both as a social institution and as a technological form. Various methods by which television texts might be analysed are presented, and different genres are compared and discussed.

Prerequisite: Mass Communication 27.211 or permission of the School.

Lectures and discussion three hours a week.

Mass Communication 27.343 ★

Communication Technology and Culture

An examination of the relationship between communication technology and society. The course examines the factors that contribute to changes in the collection, storage and distribution of information and their cultural implications.

Prerequisite: Mass Communication 27.211, or Public Affairs and Policy Management 58.200 and registration in the Communication Information Technology Policy specialization of the Bachelor of Public Affairs and Policy Management, or permission of the School. Seminar three hours a week.

Mass Communication 27.346 ★

Media Construction and Social Issues

A study of the industrial-bureaucratic structures of the news media and their relevance to the reporting of social and political issues; an examination of the dominant discourses on these issues and their relevance for the organization of newswork. The issues vary from year to year.

Prerequisite: Mass Communication 27.211, or Public Affairs and Policy Management 58.200 and registration in the Communication Information Technology Policy specialization of the Bachelor of Public Affairs and Policy Management, or permission of the School. Lectures and discussion three hours a week.

Mass Communication 27.348 ★

Advertising: A Critical Perspective

This course explores and critically analyzes some of the major constructs and basic mechanisms of the advertising system. This will include an examination of the social, political-economic and cultural implications of advertising.

Prerequisite: Mass Communication 27.211 or permission of the School.

Lecture three hours a week.

Mass Communication 27.352 ★

Telecommunications Regulation

The law regulating Canadian broadcasting and communications industries. Focus on the Canadian Radio-Television and Telecommunications Commission. Topics may include: administrative formulation of policy, ownership rules, program content and quality, access to the media, cablevision licensing and control, alternative sanctions. (Also listed as Journalism 28.352 ★ and Law 51.352 ★.)

Prerequisite: One of Law 51.203, 51.204 or 51.205, or a 200-level Journalism or Mass Communication credit.

Lectures and discussion three hours a week.

Mass Communication 27.354 ★

Pragmatics

The theoretical study of language use as pursued by linguists and philosophers. Topics include: conversational implicature; deixis; the semantics-pragmatics boundary; speaker's reference; speech acts. (Also listed as Linguistics and Applied Language Studies 29.354 ★ and Philosophy 32.354 ★.)

Precludes additional credit for Mass Communication 27.280, Lin-

guistics 29.280 and Philosophy 32.280.

Prerequisite: Second-year standing or at least 0.5 credits in Philosophy or Linguistics and Applied Language Studies.

Lectures and discussion three hours a week.

Mass Communication 27.355 ★

Media and Gender

Examination of the role of mass media in shaping our conceptions of gender roles. Evaluation of the social, political and cultural consequences of such conceptions.

Prerequisite: Mass Communication 27.211 or permission of the School.

Lectures and discussion three hours a week.

Mass Communication 27.357 ★

Special Topic

An examination of a special topic in mass communication not covered in depth in other courses. The topic varies from year to year. Possible topics include: communications policy analysis; the political economy of the mass media; and the social impact of new communications technology.

Topic for 1999-2000: Electronic Communication in Canada. This course looks at the electronic media in Canada from the introduction of the telegraph in 1846 to the present-day information highway. It considers the formative influences on new media and the key communication policies and social concerns that surround them.

Prerequisite: Mass Communication 27.211 or permission of the School.

Mass Communication 27.400 ★

Advanced Communication Research: Quantitative Methods

Methodological issues and statistical techniques for investigating theoretical questions concerning mass communication and society. Content varies yearly, but focus is on advanced statistical methods. Precludes additional credit for Mass Communication 27.401

Prerequisites: Mass Communication 27.201 and 27.311 and Honours standing in Mass Communication, or 27.300 and registration in the Strategic Public Opinion and Policy Analysis specialization of the Bachelor of Public Affairs and Policy Management, or permission of the School.

Mass Communication 27.402 ★

Advanced Communication Research: Qualitative Methods

Methodological issues appropriate for investigating theoretical questions of mass communications and society. Seminar content varies yearly as selection of appropriate methodologies and models may depend on questions investigated. Topics may include field research methods, policy/document analysis, historical research.

Precludes additional credit for Mass Communication 27.401.

Prerequisites: Mass Communication 27.201 and 27.311 and Honours standing in Mass Communication, or 27.300 and registration in the Strategic Public Opinion and Policy Analysis specialization of the Bachelor of Public Affairs and Policy Management, or permission of the School.

Mass Communication 27.410 ★

Selected Topics in Mass Communication Analysis

For 1999-2000, the topic for Section A is: Communication and the Public Interest Examination from a communications perspective of the debate over determining the public interest. Conflicting visions of the role of public opinion in a democracy are considered with reference to developments such as increased literacy, newspaper commercialization, and the growth of propaganda and mass culture.

Precludes additional credit for Mass Communication 27.411.

Prerequisite: Mass Communication 27.311 and Honours standing in Mass Communication or permission of the School.

Seminar three hours a week.

Mass Communication 27.412 ★

Selected Topics in Mass Communication Analysis

For 1999-2000, the topic for Section A is: Communication and the City. An examination of cultures of the contemporary global city. Relationships among place, culture, and communication. For 1999-2000, the topic for Section B is: State Theories, Communication and Society. Examination of major theories of the State and their link with communication institutions in modern Canadian society, with a focus on the changing role of the State in relation to its intervention in communication issues.

Precludes additional credit for Mass Communication 27.411.

Prerequisite: Mass Communication 27.311 and Honours standing in Mass Communication or permission of the School.

Seminar three hours a week.

Mass Communication 27.420 ★

Children, Youth and Media

Children and youth as they relate to mass media and popular culture. Historical and theoretical analysis of the emergence of childhood as a category in the media.

Precludes additional credit for Mass Communication 27.412 ★ (if taken in 95-96, 96-97, 97-98).

Prerequisite: Honours standing in Mass Communication and Mass Communication 27.311 or permission of the school.

Seminar three hours a week.

Mass Communication 27.435 ★

New Media, New Policies

This course focuses on major policy issues arising from media convergence, increased competition within the communication industries, new technologies, and globalization. The rationale, structure, nature and goals of regulation and communication policy for 'new media' are considered.

Prerequisites: Mass Communication 27.311 and Honours standing in Mass Communication, or Public Affairs and Policy Management 58.300 ★ and registration in the Communication Information Technology Policy specialization of the Bachelor of Public Affairs and Policy Management, or permission of the School.

Mass Communication 27.450 ★

Mass Media and Capitalist Democracy I

Examination of major interpretive frameworks for understanding the general historical development of mass communication capitalist democracies such as Canada, Britain, and the United States.

Prerequisites: Mass Communication 27.311 and Honours standing in Mass Communication or permission of the School.

Mass Communication 27.451 ★

Mass Media and Capitalist Democracy II

Consideration of issues related to the history of mass communication in order to assess current theoretical perspectives on media and culture.

Prerequisite: Mass Communication 27.450 ★ or permission of the School.

Mass Communication 27.497

Honours Essay

The Honours Essay, which is a major research essay, is carried out under the direction of a faculty supervisor. The Honours Essay is evaluated by both the supervisor and an appointed reader.*

Prerequisite: Fourth-year Honours standing in Mass Communication.

* Students should refer to general Faculty regulations regarding submission of Honours Essays (see p. 67).

Mathematics and Statistics (Science)

4302 Herzberg Building
Telephone: 520-2155
Undergraduate Adviser: 520-2150

Academic Administration

Director, K.S. Williams

Associate Director, M.J. Moore

Associate Director, Institute for Graduate Studies and Research in Mathematics and Statistics, C.W.L. Garner

Adviser for Undergraduate Studies, K. Small

Co-operative Education Program Adviser, S. Mills

Teaching Staff

Professors Emeriti

M. Csörgö, B.A. (Budapest), M.A. (McGill), Ph.D. (McGill), F.R.S.C. • **D.A. Dawson**, B.Sc., M.Sc. (McGill), Ph.D. (Massachusetts Institute of Technology), F.R.S.C. • **V.Dlab**, R.N.Dr. (Charles), C.Sc. (Charles), Ph.D. (Khartoum), D.Sc. (Charles), F.R.S.C. • **M.S. Macphail**, B.A. (Queen's), M.A. (McGill), D.Phil. (Oxford), D.Sc. (Carleton), F.R.S.C. • **H.H. Schirmer**, M.A., Ph.D. (Frankfurt)

Professors

J.D. Dixon, M.Sc. (Melbourne), Ph.D. (McGill) • **Cyril W.L. Garner**, B.Sc. (New Brunswick), M.A., Ph.D. (Toronto), F.T.I.C.A. • **Angelo B. Mingarelli**, B.Sc. (Concordia), M.Sc., Ph.D. (Toronto) • **J.N. Pandey**, M.Sc. (Banaras Hindu), Ph.D. (New York) • **J.N.K. Rao**, Ph.D. (Iowa State), F.R.S.C. • **Luis Ribes**, Licenciado en Matematicas (Madrid), M.A., Ph.D. (Rochester), Doctor en Ciencias (Madrid) • **Bruce Richter**, B.Sc. (McGill), M.Math, Ph.D. (Waterloo) • **Kenneth Stuart Williams**, B.Sc. (Birmingham), M.A., Ph.D. (Toronto), D.Sc. (Birmingham)

Associate Professors

Amitava Bose, B.Sc., M.Sc. (McGill), Ph.D. (Carleton) • **Che-Kao Fong**, B.Sc. (Chinese University of Hong Kong), M.Sc., Ph.D. (Toronto) • **Zhicheng Gao**, B.A. (Nanjing), Ph.D. (California at San Diego) • **Roger Herz-Fischler**, B.Sc. (Polytechnic Institute of Brooklyn), M.A., Ph.D. (Oregon) • **A.B.M.L. Kabir**, M.Sc. (Dacca), Ph.D. (Western Ontario) • **L.E. May**, B.Sc., M.Phil. (London), Ph.D. (North Carolina State) • **Sam Melkonian**, B.Sc., M.Sc., Ph.D. (McGill) • **Shirley Mills**, B.Sc., M.Sc. (Manitoba), Ph.D. (Alberta) • **M.J. Moore**, B.Sc., Ph.D. (Birmingham) • **Brian C. Mortimer**, B.Sc. (Carleton), M.Sc. (Alberta), Ph.D. (London) • **Edward J. Norminton**, M.A. (Western Ontario), Ph.D. (Toronto) • **John C. Poland**, M.Sc., Ph.D. (McGill) • **Irwin S. Pressman**, B.Sc. (Manitoba), M.B.A. (Toronto), Ph.D. (Cornell) • **Barbara Szyszkowicz**, B.Sc., M.Sc. (Wroclow), Ph.D. (Carleton)

Assistant Professors

Marion J. MacLeod, B.Sc., M.Sc. (Queen's) • **Majid Mojirsheibani**, B.Sc., M.Sc., Ph.D. (Toronto)

Distinguished Research Professors

M. Csörgö • **D.A. Dawson** • **V. Dlab** • **E.O. Kreyszig** • **M. Rahman** • **A.K.Md.E. Saleh**

Adjunct Research Professors

M. Chacron • **D. Krewski** (Health Canada) • **S.A. Naimpally** • **P. Révész** (Academy of Sciences, Hungary) • **A.B. Singh** (Statistics Canada)

Adjunct Professors

J.E. Graham • **K. Hardy** • **P. Mandl** • **L.D. Nel** • **B.M. Puttaswamaiah** • **A. Smith** • **G.K. Zelmer**

Sessional Lecturers

A. Alaca • **S. Alaca** • **E. Benhin** • **A. Galanova** • **I. Ganadry** • **D. Haziza** • **M.A. Hemmi** • **P. Mandl** • **A. Monadi** • **T. Qazi** • **A. Woodside**

Programs in Mathematics and Statistics

The School of Mathematics and Statistics offers a wide variety of programs ranging from those giving a strong training in the theoretical aspects of mathematics and statistics to those which emphasize applications to industry and government.

The School offers both Honours and Major programs leading to the B.Math. degree. The following is a list and short description of the programs which are available:

Mathematics (Honours and Major B.Math.)

The Major programs are generally less theoretical than the Honours programs which may form an excellent introduction to graduate studies. The main areas of concentration are: algebra, analysis, topology, applied mathematics (classical and modern), statistics and probability.

Computer Mathematics (Honours and Major B.Math.)

The programs in computer mathematics are designed to provide a student with a background of computer-related mathematical ideas together with a firm base of computer science. These programs are of interest to students who are preparing for careers in government, industry, management, or systems analysis.

The Honours Computer Mathematics program also includes an Information Technology stream.

Statistics (Honours and Major B.Math.)

The Honours program is designed primarily for a student who wishes to prepare for a career as a professional statistician. The Major program in Statistics provides the academic groundwork for employment opportunities at the junior methodologist level, in a variety of statistics-related fields.

Computer Statistics (Honours B.Math.)

The Honours program in Computer Statistics is designed to provide students with a broad background in three complementary disciplines — computing, statistics, and mathematics — as preparation for careers in informatics (the collection, management, and analysis of information).

Computer Science and Mathematics (Honours B.Math.)

The Combined Honours program in Computer Science and Mathematics is a limited-enrolment program resembling the Bachelor of Computer Science program, placing equal emphasis on computer science and mathematics. There are two options available for concentration, namely:

Computing Theory and Numerical Methods
Statistics and Computing

Mathematics and Economics (Honours B.Math.) Statistics and Economics (Honours B.Math.)

The Combined Honours programs in Mathematics and Economics, or in Statistics and Economics, provide students with a strong blend of courses in these modern disciplines.

Mathematics and Physics B.Sc.(Double Honours)

This program, which requires a minimum of 21.5 credits, is intended for students with a very strong background and interests in both mathematics and physics.

Combined B.Math./M.Sc. in Mathematics, or in Statistics

This program is designed as a “fast-track” to enable exceptional students to graduate in four years, with both a B.Math. and an M.Sc.

Admission Requirements

Bachelor of Mathematics (Honours) Programs offered by the School of Mathematics and Statistics

First Year (Honours Programs)

1. The OSSD including six OACs with an average of 75 percent or better, or equivalent, including a core consisting of an OAC in calculus and an OAC in algebra and geometry. An average of 65 percent or better is required over the two core OACs; or
2. The successful completion of 5.0 credits approved for a Qualifying-University year program with a GPA of 8.0 or better, including the core of: 0.5 credit in calculus and 0.5 credit in algebra.

Mathematics 69.007★ and 69.017★ must be successfully completed with a GPA over the two courses of 5.0 or better.

The combined B.Math./M.Sc. program in Mathematics, or in Statistics has a higher admission requirement than that stated above (see p. 349).

The Co-operative Education options have a higher admission requirement than those stated above (see p. 348).

Students presenting credits for one or more repeated subjects or courses may not be admitted directly into an Honours program except on the recommendation of the School. Applicants should note that meeting the minimum requirements stated above does not guarantee admission to the B.Math. programs. Students presenting OAC (or equivalent) averages lower than those stated above might be admissible on an individual basis after consideration of whether there are special circumstances which would permit their admission.

Advanced Standing [Honours Programs]

1. An in-course student wishing to enter an Honours program must apply to the Undergraduate Advisor, or the Associate Director, through the Registrarial Services office for the Faculty of Science.
2. For entry to an Honours program after the completion of First year, a student must have a GPA of 5.0 or better in the Honours subject(s), an overall GPA of 4.0 or better and the recommendation of the School. A student beginning the final 10.0 credits towards an Honours degree must present a GPA of 6.0 or better in the Honours subject(s), an overall GPA of 5.0 or better and the recommendation of the School. A student beginning the final 5.0 credits towards an Honours degree must present a GPA of 6.5 or better in the Honours subject or in each Honours subject and a GPA of 5.0 or better overall, as calculated for graduation.
3. Students applying for admission to a B.Math.(Honours) program at Carleton after having obtained a degree from Carleton or another university shall meet the same criteria as specified above.
4. No student may be admitted to a B.Math.(Honours) program without satisfying the requirements for entry to the corresponding Major program.
5. Students in the final year of a Major degree program wishing to be considered for entry to an Honours program must apply to the Registrarial Services office for the Faculty of Science to have their names withdrawn from the graduation list before March 1 of that year. If subsequently the student is not accepted for an Honours program, the student must reapply for graduation.

Applicants from outside the province of Ontario must present acceptable equivalent certificates generally required for admission to universities in their own provinces or countries. Applicants should note that meeting the minimum requirements stated above does not guarantee admission to the B.Math. programs.

Students presenting OAC (or equivalent) averages lower than those stated above might be admissible on an individual basis after consideration of whether there are special circumstances which would permit their admission.

Bachelor of Mathematics (Major) Programs offered by the School of Mathematics and Statistics

First Year (Major Programs)

1. The OSSD including six OACs with an average of 70 percent or better, or equivalent, including a core consisting of an OAC in calculus and an OAC in algebra and geometry. An average of 65 percent or better is required over the two core OACs. Students presenting an average of 65 to 69 percent over the six OACs may be considered on an individual basis; or
2. The successful completion of 5.0 credits approved for a Qualifying-University year program with a GPA of 7.0 or better, including the core of: 0.5 credit in calculus and 0.5 credit in algebra. Mathematics 69.007★ and 69.017★ must be successfully completed with a GPA over the two courses of 5.0 or better.

Advanced Standing [Major Programs]

1. In order to be admitted to Second year, a student must have completed the equivalent of a First-year B.Math. program with the required academic standing.
2. Applications for admission to Third year will be evaluated on their merits, and advanced standing granted for studies undertaken elsewhere when these are recognized as the equivalent of subjects offered at Carleton University.

3. Students not admitted to a degree program but taking courses at Carleton University as Special students may, on transfer to a B.Math. program, receive credit for not more than 7.0 credits, 4.0 of which must meet the First-year promotion requirements.

Course Requirements

The precise course requirements for each of the programs offered by the School of Mathematics and Statistics are given under the specific program entries below.

In the following, reference to the B.Math.(Honours) programs should be understood to include the B.Sc.(Double Honours) program in Mathematics and Physics also.

Statistics course requirement

Students in all non-combined programs offered by the School of Mathematics and Statistics must present at least 0.5 credit in statistics in order to graduate.

In the major programs, and in the Information Technology stream of Honours Computer Mathematics, Mathematics 69.257 ★ is required.

In the honours programs in Mathematics, Computer Mathematics [excluding the Information Technology stream], Statistics, and Computer Statistics, Mathematics 70.259 ★ is required.

It is recommended that, when possible, one of Mathematics 69.257 ★ or 70.259 ★ be taken **early** in the student's university program.

Note: regarding Arts and Social Science Courses, and Electives

All courses offered by the Faculty of Arts and Social Sciences and in the Faculty of Public Affairs and Management may be used as arts and social science electives and/or free electives, except for those courses noted below.

First Year Course Pattern

For students admitted to a program offered by the School of Mathematics and Statistics, the First-year program leading to the Bachelor of Mathematics degree consists of 5.0 credits, as follows:

- (a) at least 1.0 credit in Mathematics;
- (b) 1.0 credit from the College of Natural Sciences or from the School of Computer Science;
- (c) 1.0 additional credit in Mathematics, or from the College of Natural Sciences or the School of Computer Science;
- (d) 2.0 additional elective credits (excluding Science 60.101 ★, 60.102 ★, 60.201 ★, Social Sciences 03.300 ★, and Computer Science 95.101 ★).

In establishing their First-year program of courses, students should consult with the Undergraduate Advisor, or the Associate Director, of the School of Mathematics and Statistics.

It should be noted that, in Mathematics and Statistics, most of the advanced courses are given during the day only. Students are advised to consult the School as early as possible to arrange their programs.

Courses Approved for a First-Year B.Math. Program

Science Courses

Biochemistry 63.220 ★

Biology 61.103 ★, 61.104 ★, 61.192 ★, 61.193 ★, 61.216 ★; or if 61.103 ★ and 61.104 ★ have been completed prior to First year, with permission, any two of: 61.201 ★, 61.202 ★, 61.214 ★, 61.220 ★

Chemistry 65.010, 65.100; or if 65.100 has been completed prior to First year, with permission: 65.211 ★, 65.212 ★, 65.223 ★,

65.224 ★, 65.226 ★, 65.227 ★, 65.228 ★, 65.232 ★, 65.233 ★ or 65.280 ★

Computer Science 95.102 ★, 95.104 ★, 95.105 ★, 95.106 ★, 95.107 ★, 95.108 ★

Geography 45.105

Geology 67.100, 69.104 ★, 67.105; or if one of Geology 67.100 or 67.105 has been completed prior to First year, with permission, any two of: 67.223 ★, 67.225 ★, 67.228 ★, 67.231 ★, 67.236 ★, 67.238 ★, 67.241 ★, 67.242 ★, 67.243 ★, 67.281 ★, 67.282 ★, 67.285 ★, 67.383 ★

Mathematics 69.017 ★; 69.102, 69.112; 69.107 ★, 69.117 ★, 69.207 ★, 69.217 ★; 69.257 ★, or any Mathematics course for which the student has the prerequisite.

Physics 75.101 ★, 75.102 ★, 75.107 ★, 75.108 ★, 75.190; or if one of 75.101 ★ and 75.102 ★ or 75.107 ★ and 75.108 ★ has been completed prior to First year, with permission, any two of: 75.211 ★, 75.222 ★, 75.223 ★, 75.224 ★, 75.235 ★, 75.236 ★, 75.262 ★, 75.291 ★, 75.292 ★

Arts and Social Science Courses

Any course available from the Faculty of Arts and Social Sciences or the Faculty of Public Affairs and Management with the exception of:

Social Sciences courses as listed below. Advanced courses in certain disciplines may be included if the prerequisite has been completed prior to First year.

Social Sciences Courses not Acceptable as Social Sciences Electives

Social Sciences courses are available in the Faculty of Arts and Social Sciences and the Faculty of Public Affairs and Management.

However, the following Social Sciences courses are **not acceptable** as Social Sciences electives.

Business 42.101 ★, 42.102 ★, 42.104 ★, 42.105 ★, 42.142 ★, 42.201 ★, 42.202 ★, 42.230 ★, 42.242 ★, 42.270 ★, 42.301 ★, 42.308 ★, 42.400 ★, 42.401 ★, 42.402 ★.

Economics 43.220, 43.240 ★, 43.404 ★, 43.405 ★, 43.476 ★, 43.477 ★.

Geography 45.105, 45.207 ★, 45.302 ★, 45.303 ★, 45.305 ★, 45.306 ★, 45.307 ★, 45.311 ★, 45.312 ★, 45.313 ★, 45.315 ★, 45.318 ★, 45.319 ★, 45.400 ★, 45.402 ★, 45.403 ★, 45.405 ★, 45.406 ★, 45.408 ★, 45.411 ★ (Geology 67.415 ★), 45.413 ★ (Engineering 81.303 ★, Geology 67.419 ★), 45.414 ★, 45.417 ★ (Engineering 82.424 ★, Geology 67.424 ★), 45.418 ★.

Interdisciplinary Social Sciences 03.300 ★.

Psychology 49.200, 49.220 ★, 49.270 ★, 49.300, 49.320, 49.321 ★, 49.322 ★, 49.323 ★, 49.324 ★, 49.325 ★, 49.326 ★, 49.327 ★, 49.356 ★, 49.370, 49.372 ★, 49.380, 49.401 ★.

Sociology 53.370.

Course Load

The normal course load for a full-time student in the School of Mathematics and Statistics, during the Fall/Winter session, is the equivalent of 5.0 credits. The normal course load for a part-time student, in the Fall/Winter session, is the equivalent of 2.0 credits.

Students may register for a maximum of 2.0 credits in the Summer session.

A student may exceed the normal course load in the Fall/Winter session only with the Registrar's permission, which may be granted if a C average is maintained overall and in the Major field, and if recommended by the School.

Part-time students may be granted permission if a C average is obtained in a minimum of 2.0 credits in the previous session.

Continuation in Honours

In order to continue in an Honours program, at the end of First year, the student must maintain a GPA of 5.0 or better in the Honours subject(s), an overall GPA of 4.0 or better and be recommended by the School. A student beginning the final 10.0 credits towards an Honours degree must present a GPA of 6.0 or better in the Honours subject(s), an overall GPA of 5.0 or better and the recommendation of the School. At the beginning of their last 5.0 credits students must have:

- (a) a GPA of 6.5 or better in the Honours subject or in each Honours subject;
- (b) an overall GPA of 5.0 or better;
- (c) a grade of C- or better in at least half of the credits to be credited toward their degree;
- (d) the recommendation of the School. Otherwise the student may not remain in Honours;
- (e) students who have a GPA of 6.3 or 6.4 in their Honours subject may be allowed to continue at the discretion of the School.

Note: The B.Math. Combined Honours program: Computer Science and Mathematics has a higher GPA requirement for continuation than that stated above. Please refer to the combined honours section of this Calendar (see p. 346) for further details.

The B.Sc.(Double Honours) program in Mathematics and Physics has a higher GPA requirement for continuation (after First year) than that stated above. Please refer to the combined honours section of this Calendar (see p. 347) for further details.

The combined B.Math./M.Sc. program in Mathematics, or in Statistics has a higher GPA requirement for continuation than that stated above. Please refer to the B.Math./M.Sc. program section (see p. 349) for more details.

The B.Math. Co-op programs in the School of Mathematics and Statistics have a higher GPA requirement for continuation than that stated above. Please refer to the Mathematics and Statistics Co-op program section of this Calendar (see p. 347) for further details.

A student who fails to maintain Honours standing may not remain in Honours, and is recommended to discuss a new program with the Undergraduate Advisor, or with the Associate Director of the School.

Promotion and Failure

Full-time Students

Full-time students in a First-year B.Math. program, in order not to fail their year in May, must, by then, have passed at least 3.0 credits. Students who fail to meet this requirement must apply by June 30 for readmission to a B.Math. program; students who fail a First-year B.Math. program for a second time are not eligible to apply for readmission to the School of Mathematics and Statistics.

In order to be promoted to the credit system from First year, a full-time student must have passed at least 4.0 credits including at least 3.0 credits in Science. The 3.0 credits in Science must include at least 1.0 credit in Mathematics, and at least 1.0 credit from the College of Natural Sciences or from the School of Computer Science.

Of these 4.0 credits, at least 2.0 credits (including at least 1.0 credit in Mathematics) must be completed with grades of C- or better.

Students in an Honours program must have a GPA of 6.0 or better in Mathematics 69.102 and 69.112, and a GPA of 7.0 or

better in any credits offered from Mathematics 69.107★, 69.207★, 69.117★, 69.217★, and in addition, an overall GPA of 4.0 or better.

Students in a Major program must have a GPA of 4.0 or better in Mathematics 69.102 and 69.112, and a GPA of 5.0 or better in any credits offered from Mathematics 69.107★, 69.207★, 69.117★, 69.217★.

For a student without advanced standing in any First-year courses, these 4.0 credits must be selected from those approved for a First-year B.Math. program.

For a student (not repeating First year) with advanced standing in some First-year courses, these 4.0 credits must include sufficient courses to complete the First-year B.Math. program; the remainder of the 4.0 credits may include courses beyond the First year provided the student has retained credit for the prerequisite First-year courses. In the Major program one of the grades of C- or better must be in Mathematics.

This must be accomplished in one calendar year (12-month period) with not more than 2.0 credits of Summer courses. The course work of those First-year B.Math. students who almost meet promotion requirements is reviewed by the Dean's Committee on Promotion.

A full-time student who does not meet the requirements of promotion by the end of the August examinations will have failed First year.

Part-time Students

In order to be promoted to the credit system from First year, part-time students must, in the first 6.0 credits of final examination attempts, have passed at least 4.0 credits including at least 3.0 credits in Science. The 3.0 credits in Science must include at least 1.0 credit in Mathematics, and at least 1.0 credit from the College of Natural Sciences or from the School of Computer Science.

Of these 4.0 credits, at least 2.0 credits [including at least 1.0 credit in Mathematics] must be completed with grades of C- or better.

Students in an Honours program must have a GPA of 6.0 or better in Mathematics 69.102 and 69.112, and a GPA of 7.0 or better in any credits offered from Mathematics 69.107★, 69.207★, 69.117★, 69.217★, and in addition, an overall GPA of 4.0 or better.

Students in a Major program must have a GPA of 4.0 or better in Mathematics 69.102 and 69.112, and a GPA of 5.0 or better in any credits offered from Mathematics 69.107★, 69.207★, 69.117★, 69.217★.

Part-time students who fail more than 2.0 credits must apply for readmission to the School of Mathematics and Statistics.

Consequences of Failure

Failed students within the limitations specified above may repeat First year, retaining credit toward their degree (but not toward the completion of First year) for all courses graded C- or better.

A student repeating First year may register only in courses approved for a First-year B.Math. program, but may include 2.0 credits beyond the First year provided the student has retained credit for the prerequisite First-year course.

A student who fails First year a second time may not re-enter a B.Math. program.

After promotion to the credit system, the student will accumulate course credits under a pattern approved by the School of Mathematics and Statistics.

Limit on Examination Attempts (after First-year Promotion)

Honours degree students have the privilege of repeating or replacing courses subject to the following restriction: After admission to the credit system, the ratio of total number of (full-credit equivalent) examinations to the total number of credits required may not exceed six to five. In particular, a student who requires 15 more credits has the equivalent of at most 18.0 full-credit examinations available to complete the program.

Major degree students have the privilege of repeating or replacing courses, subject to the following restriction: After admission to the credit system the ratio of total number of (full-credit equivalent) examinations to the total number of credits required may not exceed three to two. In particular, a student who requires ten more credits has the equivalent of at most 15.0 full-credit examinations available to complete his or her program.

The number of examinations available to a student who transfers from another institution or from another program, will be determined on a pro rata basis and will be specified at the time of admission.

When a student is examined in a course that previously has been declared extra to the degree program, this examination does not affect the remaining number of available examinations.

Students who cannot complete their program without exceeding the available number of examinations forfeit their undergraduate status in the program.

Graduation Regulations

In order to graduate, students must fulfill all University graduation regulations (see p. 48) and all School regulations and requirements as set out below.

The regulations which follow immediately below, refer to the specific programs indicated. The General Regulations apply to all programs offered by the School of Mathematics and Statistics.

B.Math.(Honours) program in Computer Mathematics:

- (i) a GPA of 6.5 or better on the minimum of 11.0 required credits in mathematics; and
- (ii) a GPA of 6.5 or better on the minimum of 11.0 credits in mathematics and 3.0 credits in computer science.

B.Math.(Honours) program in Computer Mathematics - Information Technology stream:

- (i) a GPA of 6.5 or better on the 9.0 required credits in Mathematics; and
- (ii) a GPA of 6.5 or better on the 13.5 credits in Mathematics and Computer Science.

B.Math.(Honours) program in Computer Statistics:

- (i) a GPA of 6.5 or better on the 9.0 required credits in mathematics; and
- (ii) a GPA of 6.5 or better on the 13.5 credits in mathematics and computer science.

B.Math.(Honours) program in Statistics:

- (i) a GPA of 6.5 or better on the minimum of 11.0 credits in Mathematics and 1.0 credit in Computer Science; and
- (ii) a GPA of 6.5 or better on the 5.0 credits in Statistics (Mathematics 70.259★, 70.265★, 70.355★, 70.356★, 70.358★, 70.359★, 70.450★, and the 1.5 credits selected from 70.451★ to 70.459★).

For students in Honours programs:

The designation of Honours degree will be determined by the student's GPA on all required credits in the Honours subjects, as stated in the program requirements; however, the School may use discretion in counting the number of Honours credits, where students have more than the minimum number of required credits.

For students in the Combined Honours programs:

The designation of Honours degree will be determined by the student's GPA on all required credits in the two Honours subjects, as stated in the respective program requirements; however, the schools may use discretion in counting the number of Honours credits, where students have more than the minimum number of required credits.

B.Math.(Major) program in Computer Mathematics:

- (i) a GPA of 4.0 or better on the 6.5 required credits in mathematics; and
- (ii) a GPA of 4.0 or better on the 10.0 credits in mathematics and computer science.

B.Math.(Major) program in Statistics:

- (i) a GPA of 4.0 or better on the minimum of 6.0 credits in Mathematics; and
- (ii) a GPA of 4.0 or better on the 3.5 credits in Statistics (Mathematics 69.257★, 69.259★, 69.353★, 69.354★, 69.357★, 69.358★ and 69.359★).

General Regulations

1. Every student will be required to complete the last 5.0 credits at Carleton University unless authorized by the School of Mathematics and Statistics to take courses at the University of Ottawa under the Undergraduate Exchange Agreement.
2. A student who takes courses elsewhere with a Letter of Permission from the Science Committee on Admission and Studies may, with the approval of the School of Mathematics and Statistics, use the credit value but not the grades to meet graduation requirements;
3. Students who transfer to the School of Mathematics and Statistics from another institution must include in the courses presented for degree (whether obtained at Carleton or elsewhere) at least:
 - (a) 2.0 credits of Arts or Social Sciences electives if on transfer they received credit for less than ten credits;
 - (b) 1.0 credit of Arts or Social Sciences electives if on transfer they received credit for 10.0 or more credits.

Note: See also University graduation regulations, p. 48.

Honours Degree Students

To qualify for graduation with a Bachelor of Mathematics degree with Honours a student must:

1. present credits for at least 20.0 credits of approved full credits (or equivalent) beyond Qualifying-University year, with not more than 2.0 credits below the 100-level and not more than 7.0 below the 200-level;
2. meet the requirements of the "Faculty of Science and of the" School of Mathematics and Statistics with respect to both course and grade requirements;
3. after entry to the credit system, have completed the program with not more than 6.0 (full credit equivalent) examinations for every 5.0 credits required. (Examinations include course repetitions and replacements.) A part-time student or a full-time student who

has interrupted his or her studies must complete the program within seven years after entry to courses beyond First year;

4. include at least 2.0 credits in the Honours subject or subjects in the last 5.0 credits taken;
5. be recommended by the School of Mathematics and Statistics and the Science Faculty Board.

The Honours degree will not be awarded to students taking fewer than 5.0 credits at Carleton.

Designations of Honours Degrees

Three designations of Honours are awarded, determined on the basis of the GPA as follows:

Highest Honours

10.0 - 12.0 in Honours subject, and
8.0 or better overall

High Honours

9.0 or better in Honours subject, and
7.0 or better overall

Honours

6.5 or better in Honours subject, and
5.0 or better overall

The School of Mathematics and Statistics may recommend the higher designation of Honours degree in the case of a student one of whose indices is in the appropriate higher range and the other within 0.2 grade points of the higher range.

To determine the class of degree for students with Combined Honours, the average is computed on the basis of the weighted average of the required number of Honours credits in the two subjects. If agreeable to the committee concerned, the average may be taken in each of the two subjects and the simple average of the two may be used.

The School of Mathematics and Statistics may use discretion for establishing the class of degree in counting the number of Honours credits where students have more than the minimum number of credits.

Combined B.Sc./M.Sc. in Mathematics or in Statistics

See p. 349.

Major Degree Students

To qualify for graduation students must:

1. present credits for 15.0 approved full courses (or equivalent) beyond Qualifying-University year with not more than 2.0 credits below the 100-level and not more than 7.0 below the 200-level;
2. have a grade of C- or better in at least half of the 15.0 credits;
3. have an average of C- or better in the credits in their Major subject or subjects;
4. after entry to the credit system, have completed the program with not more than three (full-course equivalent) examinations for every 2.0 credits required. (Examinations include course repetitions and replacements.) Part-time students or full-time students who have interrupted their studies must complete the program within seven years after entry to courses beyond First year;
5. include at least 2.0 credits in the Major subject or subjects in the last 5.0 credits taken for credit;
6. be recommended by the School of Mathematics and Statistics and the Science Faculty Board.

To meet the requirements for the C- average in the Major stated above, only those credits in the Major necessary to make up the required total for graduation in the School of Mathematics and

Statistics need be counted. All obligatory courses must be counted.

Graduating students in a Major program of the School of Mathematics and Statistics will be designated as graduating "with Distinction" if:

1. they have no course failures, course repetitions or course replacements on their Carleton record after promotion to the course-credit system;
2. they have achieved an overall GPA of 8.0 or better calculated on their Carleton record, including all credits extra to the degree;
3. they have successfully completed at Carleton at least 10.0 credits counted toward the degree;
4. after promotion to the course-credit system, they have achieved a GPA of 9.5 or better calculated on all Carleton credits being counted toward the degree.

Course Substitution regarding Economics 43.220:

Students registered in any Mathematics or Statistics undergraduate program may not count Economics 43.220 for credit.

Students who have already completed Economics 43.220, and who wish to enter a Mathematics or Statistics B.Math.(Major) program, may be exempted from taking Mathematics 69.257 ★ and 69.259 ★ only with permission of the School of Mathematics and Statistics, and provided the grade in Economics 43.220 is B- or better.

Courses excluded for credit in all programs offered by the School of Mathematics and Statistics

The following courses may not be counted for academic credit (even as free electives) in any program offered by the School of Mathematics and Statistics:

Economics 43.240 ★, 43.404 ★; Business 42.230 ★; Geography 45.206 ★, 45.303 ★; Political Science 47.270; Psychology 49.200, 49.300; Social Sciences 03.401 ★, 03.402 ★; Social Work 52.250, 52.351 ★, 52.352 ★; Sociology/Anthropology 53.203, 54.203, 53.370, 53.403 ★, 53.404 ★, 56.450 ★.

It is understood that a student who has successfully completed one or more of these courses prior to September 1, 1996 will retain credit for these courses.

B.Math.(Honours) Programs

Honours Core Requirements

Prospective Honours students should note that the courses Mathematics 69.102, 69.112, 70.200 and 70.210 provide more than just the basic mathematical techniques; they also provide training in rigorous mathematical thinking and, as such, are basic to the Honours Mathematics programs.

The core requirements for the Honours programs in Mathematics, Computer Mathematics, and Statistics, are as given below.

In certain cases the School may permit a student to replace a course at the Fourth-year level by a graduate course.

Each Honours program requires a total of 20.0 credits including: Mathematics 69.102, 69.112 with an average grade of C+ or better.

Alternatively, students may be admitted to an Honours program in Mathematics after successful completion of First year with:

(a) a GPA of 7.0 or better on all half credits offered from: Mathematics 69.107 ★, 69.207 ★; 69.117 ★, 69.217 ★; and

(b) a weighted GPA of 6.0 or better on all credits offered from: Mathematics 69.102, 69.107 ★, 69.207 ★; 69.112, 69.117 ★, 69.217 ★.

Note: Students offering Mathematics 69.107 ★ must then take Mathematics 69.207 ★, and students offering Mathematics 69.117 ★ must then take Mathematics 69.217 ★.

Mathematics 70.200, 70.210, 70.244 ★, 70.259 ★, 70.265 ★.

Mathematics 70.493 ★, 70.494 ★, 70.495 ★ (Honours Projects). The Honours Project in Mathematics consists of a written report on some approved topic or topics in the field of Mathematics together with a short lecture on the report. Each student should commence work on the project under a faculty supervisor before June 1 of the year before he or she intends to graduate (for full-time students, this would be the June 1 between Third and Fourth Year). The first draft of the report must be submitted to the supervisor by November 1, and the final draft to the School by January 15. Students who do not meet this latter deadline will be given the grade F.

Breadth Requirement:

At least 4.0 credits outside the School of Mathematics and Statistics and the School of Computer Science, including: at least 1.0 credit from the College of Natural Sciences, and at least 2.0 arts or social science credits. Of these 4.0 credits, at least 2.0 credits must be at the 200-level or above.

In each program, the remaining courses may be chosen from any department/school, including Mathematics and Statistics, subject only to the restriction that of the total of 20.0 credits, not more than 7.0 may be below the 200-level.

Course Requirements for Honours Programs:

Mathematics B.Math.(Honours)

This program requires a minimum of 11.0 credits in Mathematics. Course requirements for this program are:

1. Honours core requirements (see p. 344);
2. Mathematics 70.301 ★, 70.307 ★, 70.316 ★, 70.318 ★, and at least one of 70.302 ★ or 70.308 ★;
3. 1.0 credit in Mathematics (70 series) at the 300-level or above;
4. 1.5 credits in Mathematics (70 series) at the 400-level or above.

Note: It is strongly recommended that Mathematics 70.301 ★ be taken in the Third year.

Students wishing to specialize in Applied Analysis may, with permission of the School, replace items 2, 3, and 4 in the Mathematics degree requirements by:

2. Mathematics 70.302 ★, 70.307 ★, 70.308 ★, 70.346 ★, 70.356 ★, and 1.0 credit from Mathematics 69.381 ★, 69.384 ★, 69.386 ★, and Honours courses in Mathematics (70 series) at the 300-level or above;
3. Mathematics 70.470 ★, at least one of 70.471 ★, 70.472 ★, and 0.5 additional credit in Mathematics at the 400-level.

Students wishing to specialize in Stochastics may, with permission of the School, replace items 2, 3, and 4 in the Mathematics degree requirements by:

2. Mathematics 70.301 ★, 70.308 ★, 70.356 ★, 70.358 ★, 70.359 ★, and one of 70.355 ★, 69.381 ★;
3. Mathematics 70.451 ★, and 0.5 credit selected from the range 70.450 ★ to 70.459 ★;
4. 1.0 credit in Mathematics at the 400-level or above.

Students specializing in Applied Analysis or Stochastics are encouraged to include at least 1.5 credits in Computer Science in their program.

Computer Mathematics B.Math.(Honours)

This program requires a total of 20.0 credits; this includes a minimum of 14.0 credits in Mathematics and Computer Science in the main program, or 13.5 credits in Mathematics and Computer Science in the Information Technology stream.

Students may also be admitted to the Information Technology stream of this program after completing the B.Math.(Major) [or the former B.Sc.(Major) or the B.A.(Pass)] program in Computer Mathematics, provided that Faculty of Science requirements concerning Honours standing have been maintained. Students with Honours standing from their B.Math.(Major) [or the B.Sc.(Major) or the former B.A.(Pass)] program in Computer Mathematics would require 5.0 additional credits in the Information Technology stream of this honours program: 3.5 credits in Mathematics and Computer Science [6, 7, 8 below], and 1.5 credits of options [from 9].

See graduation requirements, p. 343.

Course requirements for this Honours program are as follows:

Computer Mathematics:

1. Honours core requirements ;
2. Computer Science 95.102 ★, 95.105 ★, 95.106 ★, 95.202 ★;
3. Mathematics 69.384 ★, 70.301 ★;
4. Mathematics 70.316 ★ and 70.318 ★; or Mathematics 70.385 ★ and 69.381 ★;
5. 1.0 credit from Mathematics 69.304 ★, 69.381 ★, 69.386 ★ and courses in the range Mathematics 70.302 ★ and above;
6. Mathematics 70.356 ★ or 70.358 ★;
7. Mathematics 70.486 ★, and one of 70.482 ★ or 70.483 ★;
8. an additional 0.5 credit from Mathematics 70.481 ★, 70.482 ★, 70.483 ★, 70.485 ★, 70.488 ★, or an approved 0.5 credit at the graduate level (70.580 series);
9. 1.0 additional credit in Computer Science at the 200-level or above.

Computer Mathematics - Information Technology stream:

1. Mathematics 69.102 (or 69.107 ★ and 69.207 ★), and Mathematics 69.112 (or 69.117 ★ and 69.217 ★) [for the GPA requirements over these courses, please see the GPA statement under Honours Core Requirements, p. 344];
2. Computer Science 95.102 ★, 95.105 ★, 95.106 ★, 95.202 ★, 95.204 ★;
3. Mathematics 69.208 ★, 69.257 ★, 69.265 ★; and 69.218 ★ or 69.311 ★;
4. Mathematics 69.384 ★, 70.385 ★; at least one of Mathematics 69.381 ★ or 69.386 ★; and 1.0 additional credit in Mathematics at the 300-level (excluding 69.352 ★);
5. an additional 0.5 credit in Computer Science (95-series) at the 200-level or above [and 95.305 ★ or 95.304 ★ are highly recommended]; and an additional 0.5 credit in Mathematics or Computer Science at the 200-level or above;
6. Mathematics 70.494 ★ or 70.495 ★; and 1.0 additional credit in Mathematics and Statistics, 400-level or above;
7. 1.0 credit in Computer Science (95-series) at the 300-level or above;
8. 1.0 credit in Mathematics and Statistics at the 300-level or above;
9. Students must also include 1.0 credit from the College of Natural Sciences, 2.0 arts or social science credits, and have 3.5 credits of free electives, subject to the Breadth Requirement (see above).

In this program, of the total of 20.0 credits required, not more than 7.0 may be below the 200-level.

Note : Business 42.142★, 42.242★ and Computer Science 95.101★ may not count for credit in this program, even as free electives.

Computer Statistics B.Math.(Honours)

This program is designed to provide students with a broad background in computing, statistics and mathematics in preparation for careers in informatics - the collection, management and analysis of information (e.g., data mining and knowledge discovery in databases). This program requires a total of 20.0 credits, including a minimum of 13.5 credits in Mathematics and Computer Science (8.5 in Mathematics and 4.5 in Computer Science, plus an Honours project).

See graduation requirements, p. 343.

Course requirements for this Honours program are as follows:

1. Mathematics 69.102 (or 69.107★ and 69.207★), and Mathematics 69.112 (or 69.117★ and 69.217★) [for the GPA requirements over these courses, please see the GPA statement under Honours Core Requirements, p. 344];
2. Computer Science 95.102★, 95.105★, 95.106★, 95.202★, 95.204★; one additional credit in Computer Science, 200-level or above (95.203★, 95.304★ and 95.305★ are recommended);
3. Mathematics 70.265★ (or 69.265★) and 70.259★ (may be replaced by 69.257★ and 69.259★, with a minimum grade of B in each); 70.358★ and 70.359★ (may be replaced by 69.358★ and 69.359★, with a minimum grade of B in each); 70.355★, 70.356★;
4. Mathematics 69.208★; 69.384★; 69.386★; one of 69.218★ or 69.311★;
5. Mathematics 70.493★ (Honours Project);
6. 1.5 credits from Mathematics 70.450★ - 70.459★;
7. 1.0 credit in Computer Science at the 300-level or above;
8. Students must also include 1.0 credit from the College of Natural Sciences, 2.0 arts and social science credits, and have 3.5 credits of free electives, subject to the Breadth Requirement on p. 345.

In this program, of the total of 20.0 credits required, not more than 7.0 may be below the 200-level.

Note: Business 42.142★, 42.242★ and Computer Science 95.101★ may not count for credit in this program, even as free electives.

Statistics B.Math.(Honours)

This program requires a minimum of 11.0 credits in Mathematics and Statistics. The program is of particular interest to a student wishing to pursue a career as a professional statistician.

See graduation requirements, p. 343.

Course requirements for this program are:

1. Honours core requirements (see p. 344; Mathematics 70.210 may be deferred until Third year, and may be replaced by Mathematics 69.317★, plus 0.5 credit from: Honours Mathematics at the 300-level or above, and Mathematics 69.304★, 69.381★, 69.387★, 69.389★);
2. (a) Computer Science 95.107★, 95.108★; or
(b) Computer Science 95.105★, 95.106★;
3. Mathematics 70.355★, 70.356★, 70.358★, 70.359★, 69.386★, and an additional 0.5 credit in Mathematics (70-series) at the 300-level or above;
4. Mathematics 70.450★, and 1.5 credits from the range Mathematics 70.451★ to 70.459★.

Students considering a career in actuarial science are advised to include Mathematics 69.381★ in their program.

Operations Research B.Sc. (Honours)

Students currently enrolled in the B.Sc.(Honours) program in Operations Research are governed by the requirements contained in the undergraduate calendar of the year in which they were admitted to the program.

Combined Honours Programs:

B.Math. and B.Sc.

Computer Science and Mathematics

(Combined Honours B.Math.)

This program is administered by a committee with representatives from the School of Computer Science and the School of Mathematics and Statistics.

Enrolment in this program is limited. Applicants should note that meeting the minimum published requirements for admission to this program does not imply automatic acceptance.

Continuation in the Program:

To continue in the program, a student must:

(a) by the end of August each year, have gained at least 0.5 credit in the past 12 months towards the degree requirements, and

(b) have accumulated a GPA of 6.5 or better in each of Computer Science and Mathematics, and a GPA of 5.0 or better overall. (GPAs are to include any failing grades that have not yet been replaced by a passing grade in the same or a substitute course.)

Failure to comply with these standards requires withdrawal from the program.

This program requires a minimum of 15.0 credits in Computer Science and Mathematics, placing equal emphasis on both these disciplines. Students may choose one of two options which serve as areas of concentration. All course selections must be approved both by the School of Mathematics and Statistics and the School of Computer Science. A total of 20.0 credits is required in accordance with the conditions given below.

Note: Some courses offered by the School of Business and the Department of Systems and Computer Engineering may be taken for credit as Computer Science courses in this program. For a complete list of these courses see p. 341.

Core Requirements (10.0 credits in Mathematics and Computer Science):

1. Mathematics 69.102, 69.117★; Computer Science 95.102★, 95.105★, 95.106★;

Note: Students who wish to keep open the choice of other Honours programs in Mathematics and Statistics are advised to take Mathematics 69.112 instead of 69.117★ (and 69.217★).

2. Mathematics 70.200, 69.217★; Computer Science 95.202★, 95.203★, 95.204★ and 95.304★;

3. Mathematics 70.210; Computer Science 95.300★, 95.305★, 95.384★, 95.385★; Mathematics 70.495★ or Computer Science 95.495★.

4. 1.0 credit from the College of Natural Sciences. 2.0 credits in arts or social science disciplines. Concerning social science electives, see the note on p. 345, as well as the Breadth Requirement on p. 345.

5. 2.0 free option credits, subject only to the requirement that of the total of 20.0 credits, not more than 7.0 may be below the 200-level.

Candidates must also satisfy one of the following option require-

ments, each of which contains a total of 5.0 credits in Computer Science and Mathematics.

Option: Computing Theory and Numerical Methods (CTNM)

1. Mathematics 70.244★, 70.265★;
2. Mathematics 69.381★, 69.386★ and one of Mathematics 70.301★, 70.302★, 70.307★, 70.308★;
3. Computer Science 95.484★, and 1.0 credit from Mathematics 70.481★, 70.482★, 70.483★, 70.485★, 70.486★, 70.488★;
4. 1.0 additional credit in Computer Science at the 300-level or above.

Option: Statistics and Computing (STC)

1. Mathematics 70.244★, 70.259★, 70.265★;
2. Mathematics 70.358★, 70.359★ and at least one of 70.355★, 70.356★;
3. 1.0 credit in Mathematics from the range Mathematics 70.450★ to 70.459★;
4. 1.0 credit in Computer Science at the 400-level.

Mathematics and Economics B.Math.(Honours)

This program requires 6.0 credits in Economics and 9.0 credits in Mathematics and Statistics.

Course requirements for this honours program are:

First Year:

1. Mathematics 69.102, 69.112 (or their equivalents);
2. Economics 43.100;
3. Computer Science 95.107★, 95.108★;
4. 1.0 credit free option.

Second Year:

1. Mathematics 70.200, 70.210, 70.244★, 70.265★, 70.259★ (one of 70.210 or 70.244★ may be delayed to Third Year);
2. Economics 43.202★, 43.203★, 43.212★, 43.213★.

Third Year:

1. Mathematics 70.301★, 70.358★, 70.359★, at least one of 70.302★ or 70.308★;
2. Economics 43.420★, 43.421★;
3. 1.5 credits of options.

Fourth Year:

1. an additional 0.5 credit in mathematics at the 300- or 400-level;
2. 1.0 additional credit in mathematics at the 400-level;
3. Economics 43.490 (or 43.498), and 1.0 additional credit in Economics at the 400-level;
4. 1.5 credits of options.

Notes: (a) Students in this program may not count Economics 43.240★ for Academic credit (even as a free option);

(b) Students in this program are required to meet the B.Math. "Breadth Requirement": they are required to include a credit from the College of Natural Sciences in their course requirements.

Statistics and Economics B.Math.(Honours)

This program requires 6.0 credits in Economics and a minimum of 8.5 credits in Mathematics and Statistics.

Course requirements for this honours program are:

First Year:

1. Mathematics 69.102, 69.112 (or their equivalents);
2. Economics 43.100;
3. Computer Science 95.107★, 95.108★;
4. 1.0 credit free option.

Second Year:

1. Mathematics 70.200, 70.244★, 70.265★, 70.259★, and 69.317★ (or 70.210);
2. Economics 43.202★, 43.203★, 43.212★, 43.213★.

Third Year:

1. Mathematics 70.355★, 70.356★, 70.358★, 70.359★;
2. Economics 43.420★, 43.421★;
3. 2.0 credits of options.

Fourth Year:

1. Mathematics 70.452★, 70.453★, and 0.5 credit from: 70.450★, 70.451★, 70.456★ - 70.459★, 70.495★;
2. Economics 43.490 (or 43.498) and 1.0 credit in Economics at the 400-level;
3. 1.5 credits of options (or only 1.0 credit, if 70.210 was taken instead of 69.317★).

Notes: (a) Students in this program may not count Economics 43.240★ for Academic credit (even as a free option);

(b) Students in this program are required to meet the B.Math. "Breadth Requirement": they are required to include a credit from the College of Natural Sciences in their course requirements.

Mathematics and Physics B.Sc.(Double Honours)

This program consists of 21.5 credits, of which 16.5 or 17.0 credits are in Mathematics, Physics, and Engineering Physics. Entrance after First year and continuation in the program at the end of First year requires: successful completion of First year with a GPA of 9.0 or better over the courses Mathematics 69.102 and 69.112 (or their equivalents), and a GPA of 9.0 or better over the courses Physics 75.101★ and 75.102★; or permission of the School of Mathematics and Statistics, and the Department of Physics.

First Year

Mathematics 69.102, 69.112;
Physics 75.101★, 75.102★;
1.0 credit in an experimental science: Biology 61.103★ and 61.104★, or Chemistry 65.100, or Geology 67.100 or 67.105;
0.5 credit in Computer Science: 95.105★ or 95.107★;
0.5 credit arts or social science elective.

Second Year

Mathematics 70.200, 70.210, 70.244★, 70.265★, and 69.375★;
Physics 75.222★, 75.264★, 75.382★;
0.5 credit in Computer Science.

Third Year

Mathematics 70.301★, 70.302★, 70.307★, 70.316★;
Physics 75.307★, 75.366★, 75.371★, and 75.449★;
Engineering 97.315★ and 97.399★;
0.5 credit arts or social science elective.

Fourth Year

1.0 credit in Mathematics at the 400-level or above (highly recommended: Mathematics 70.403★);
Physics 75.477★, 75.478★, and 1.0 additional credit in Physics at the 400-level or above;
Mathematics 70.495★ or Physics 75.497★ or 75.498★, and 0.5

credit Free Elective; or Physics 75.498;
1.0 credit arts or social science elective;
0.5 credit Free Elective.

Note: the Co-operative Education Option is not normally available in this program.

The Co-operative Education Option

General information on the Co-operative Education Option can be found on p. 39.

Co-operative Education formally integrates the student's academic experience with work experience in the private and public sectors. Work opportunities, which are available on a competitive basis, are coordinated to complement the student's course work and interests. Practical work experience provides insights and opportunities for development which enhances what is learned in regular course work, and prepares individuals for fulfilling careers in the work place. Specific details of the Option are to be found in the Mathematics and Statistics Co-op Student Handbook.

Admission Requirements

Students are eligible to apply to enter the Co-operative Option in one of two ways:

- (i) directly upon being accepted into the First year of any Honours program offered by the School of Mathematics and Statistics; or
- (ii) after completion of 5.0 or more credits (at least 2.0 in Mathematics/Statistics) at Carleton in any Honours program offered by the School of Mathematics and Statistics.

In case (i), students must have received marks of 80 percent or better in each of OAC Calculus and OAC Algebra and Geometry (or equivalent).

In case (ii), students must have a GPA of 8.0 or more in the mathematics and statistics courses required in their program and an overall GPA of 6.5 or better in their Mathematics and Statistics Honours program.

In addition, only for students in the Honours Computer Mathematics program, for a regular (i.e., not a preliminary) co-op work term placement, completion of at least one of Computer Science 95.202★ or 95.204★ is required for eligibility for placement.

In both cases (i) and (ii), students must:

- a) have full time status in each academic term immediately preceding a work term; and
- b) be eligible to work in Canada (for off-campus work placements).

Note that meeting the above requirements only establishes eligibility for admission to the program. Enrolment in the Co-operative Option is limited.

Application forms for admission to the Co-operative Option are available from the Co-op Office for Engineering and Science. Completed applications should be submitted to that office by January 8, May 8 and September 8 for the respective work terms. Admission decisions are based on GPA and other requirements being met by the end of the previous term.

Eligibility for Placement in the First Work Term of the Co-operative Option

To be eligible for placement in the first (regular) work term of the Co-operative Option, a student must meet the above requirements by the end of the term preceding the first job placement process.

The Preliminary Work Term

Students who have been accepted into the Co-operative Option in First year may be given the opportunity to take part in a preliminary work term at the end of their First year. To be eligible for placement in this preliminary work term, students must at the end of their first term of study:

- a) have a cumulative GPA of 10.0 or better in Mathematics and Statistics, and 10.0 or better overall;
- b) be registered as a full-time student;
- c) be eligible to work in Canada (for off-campus placements);
- d) only for students in Honours Computer Mathematics: have successfully completed at least one of Computer Science 95.102★ or 95.105★.

The Work/Study Sequence

The normal pattern of work and study terms in the Co-operative Option is as follows:

Calendar Year	Fall	Winter	Summer
1	Study Term 1	Study Term 2	
2	Study Term 3	Study Term 4	Work Term 1
3	Study Term 5	Work Term 2	Work Term 3
4	Work Term 4	Study Term 6	Work Term 5
5	Study Term 7	Study Term 8	

Each student in the Co-operative Education Program will take at least four work terms. Variations in the above pattern may be requested.

If no suitable job placements can be made, students will revert to their Honours program.

Continuation in the Co-operative Option

During a work term, Co-op Option students will register in one of five Work Term courses: Mathematics 70.220★, 70.320★, 70.321★, 70.420★ or 70.421★. The Work Term courses must be taken in addition to the number of credits required for an honours degree. Each Work Term course will be graded *Sat* or *Uns*, based on both the employer's evaluation and the student's Work Term Report.

Graduation Requirements

All work terms should normally be completed prior to starting the last academic term. In addition to satisfying the requirements of the Co-operative Option as described above, a student must have completed the required credits specified for one of the Mathematics and Statistics Honours programs and at least four work term courses graded "Satisfactory".

Students who successfully complete the Honours degree requirements and who have registered in and successfully completed at least four work term courses will receive a Co-operative Option degree designation on both their transcript and diploma.

B.Math. (Major) Programs

Core Requirements

The requirements given below are common to all Major programs in the School of Mathematics and Statistics.

In certain cases the School may permit a student to replace courses listed in the 69 series by the corresponding Honours (70 series) courses.

Each Major program requires a total of 15.0 credits, including: Mathematics 69.102, 69.112 with an average grade of C- or better.

Alternatively, students may be admitted to a Major program in Mathematics after successful completion of First year with:

(a) a minimum GPA of 5.0 on all half credits offered from: Mathematics 69.107★, 69.207★; 69.117★, 69.217★; and

(b) a minimum weighted GPA of 4.0 on all courses offered from: Mathematics 69.102, 69.107★, 69.207★; 69.112, 69.117★, 69.217★.

Note: Students offering Mathematics 69.107★ must then take Mathematics 69.207★, and students offering Mathematics 69.117★ must then take Mathematics 69.217★.

Breadth Requirement:

At least 4.0 credits outside the School of Mathematics and Statistics and the School of Computer Science, including: at least 1.0 credit from the College of Natural Sciences, and at least 2.0 arts or social science credits. Of these 4.0 credits, at least 2.0 credits must be at the 200-level or above.

In each program, the remaining courses may be chosen from any department/school, including Mathematics and Statistics, subject only to the restriction that of the total of 15.0 credits not more than 7.0 may be below the 200-level.

Course requirements for Major programs:

Mathematics B.Math. (Major)

This program requires a minimum of 7.0 credits in mathematics.

Course requirements for this program are:

1. core requirements;
2. Mathematics 69.208★, 69.218★, 69.244★, 69.257★;
3. 3.0 credits in Mathematics selected from: Mathematics 69.259★ and Mathematics (69-series) at the 300-level, excluding 69.311★ and 69.352★.

With permission of the School, one or more of the courses in requirement 3 may be replaced by a course in the 70 series at the 300- or 400-level, provided that of the total of 3.0 credits, not more than 2.0 are in the same area.

Note: Students wishing to specialize in Applied Analysis may, with the permission of the School, replace requirements 2 and 3 in the Mathematics degree requirements by:

2. Mathematics 69.208★, 69.244★, 69.257★;
3. Mathematics 69.304★, 69.307★, and one of Mathematics 69.344★, 69.381★, 69.386★, or Physics 75.381★;
4. 1.0 additional credit in Mathematics at the 300-level, excluding 69.311★ and 69.352★;

5. 1.0 additional credit at the 200- or 300-level chosen from Mathematics or Computer Science.

Students specializing in Applied Analysis are encouraged to include at least 1.5 credits in Computer Science in their program.

Computer Mathematics B.Math. (Major)

This program requires a total of 15.0 credits, including a minimum of 10.0 credits in Mathematics and Computer Science.

See graduation requirements, p. 343.

Course requirements for this program are as follows:

1. Mathematics 69.102 (or 69.107★ and 69.207★), and Mathematics 69.112 (or 69.117★ and 69.217★) [for the GPA requirements over these courses, please see the GPA statement under Core Requirements, p. 348];

2. Computer Science 95.102★, 95.105★, 95.106★, 95.202★, 95.204★;

3. Mathematics 69.208★, 69.257★, 69.265★; 69.218★ or 69.311★;

4. Mathematics 69.384★, 70.385★; at least one of Mathematics 69.381★ or 69.386★; and 1.0 additional credit in Mathematics at the 300-level (excluding 69.352★);

5. an additional 0.5 credit in Computer Science (95-series) at the 200-level or above [and 95.305★ or 95.304★ are highly recommended], and an additional 0.5 credit in Mathematics or Computer Science at the 200-level or above;

6. Students must also include 1.0 credit from the College of Natural Sciences, 2.0 arts or social science credits, and have 2.0 credits of free electives. Please see the Breadth Requirement under the Core Requirements on p. 348.

In this program, of the total of 15.0 credits required, not more than 7.0 may be below the 200-level.

Note: Business 42.142★, 42.242★ and Computer Science 95.101★ may not count for credit in this program, even as free electives.

Statistics B.Math. (Major)

This program requires a minimum of 6.0 credits in Mathematics and Statistics.

See graduation requirements, p. 343.

Course requirements for this program are:

1. core requirements;
2. Mathematics 69.208★, 69.257★, 69.259★;
3. Mathematics 69.353★, 69.354★, 69.357★, 69.358★, 69.359★;
4. 1.0 additional credit at the 200-level or above chosen in a relevant topic from courses offered by the Faculty of Science, the School of Computer Science or the Faculties of Arts and Social Sciences, or Public Affairs and Management. This credit is in addition to the breadth Requirement in the Core Requirements on p. 345.

Students majoring in Statistics are urged to include at least 1.0 credit in Computer Science in their program. Students are advised to consult the School of Computer Science regarding the most appropriate courses.

Students considering a career in actuarial science are advised to include Mathematics 69.381★ and 69.386★ in their program.

Combined B.Math./M.Sc. in Mathematics, or in Statistics

This program is designed as a "fast-track" to enable exceptional students to graduate in four years, with both a B.Math. and an M.Sc. degree. It requires a minimum of 9.5 credits in Mathematics and Statistics, and 5.5 other credits towards a B.Math.(Major) degree; and then, either 2.5 credits in graduate studies and a thesis, or 4.0 credits in graduate studies and Mathematics 70.495★ (Honours Project), for the M.Sc. degree.

Entry to this program directly from an Ontario High School requires both of the following averages:

- (i) an average of 90 percent or better on the OACs in Calculus and Algebra and Geometry; and
- (ii) an average of 85 percent or better over six OACs.

Other applicants should consult the School.

Entry and continuation in the undergraduate portion of this program as well as entry to the graduate portion require minimum GPAs of 11.0 in Mathematics and Statistics, and 10.0 overall.

Mathematics courses required for this program are:

A. for the B.Math./M.Sc. (Mathematics):

First Year

1. Mathematics 69.102, 69.112.

Second Year

2. Mathematics 70.200, 70.210, 70.244★, 70.265★, and 0.5 credit (70-series) at the 300-level or above.

Third Year

3. Mathematics 70.301★, 70.307★, 70.316★, 70.318★, and at least one of 70.302★ or 70.308★; in addition, 1.5 credits at the 400-level or above in Mathematics and Statistics.

Fourth Year

4. (registration as a graduate student) Mathematics 70.495★ and 4.0 credits in Mathematics and Statistics at the graduate level (1.0 credit of these may be in another department/school); OR: an M.Sc. thesis and 2.5 credits in Mathematics and Statistics at the graduate level (1.0 credit of these may be in another department/school).

Please refer to the Graduate Calendar for specific graduate requirements.

Students wishing to specialize in Stochastics may, with the permission of the School, replace the Second Year requirement of 0.5 credit at the 300-level or above by Mathematics 70.259★, and replace item 3 above by: Mathematics 70.301★, 70.356★, 70.358★, 70.359★, and one of 70.302★, 70.307★, 70.308★; and at least 1.5 credits at the 400-level or above in Mathematics and Statistics.

B. for the B.Math./M.Sc. (Statistics):

First Year

1. Mathematics 69.102, 69.112.

Second Year

2. Mathematics 70.200, 70.210, 70.244★, 70.259★, 70.265★.

Third Year

3. Mathematics 70.301★, 70.355★, 70.356★, 70.358★, 70.359★ and at least 1.5 credits at the 400-level or above in Mathematics and Statistics.

Fourth Year

4. (registration as a graduate student) Mathematics 70.495★ and 4.0 credits in Mathematics and Statistics at the graduate level (1.0 credit of these may be in another department/school); OR: an M.Sc. thesis and 2.5 credits in Mathematics and Statistics at the graduate level (1.0 credit of these may be in another department/school).

Please refer to the Graduate Calendar for specific graduate requirements.

Before entry into the Fourth year of this program, students must: obtain a recommendation from the School of Mathematics and Statistics to continue, apply to transfer to the B.Math.(Major) program and apply to graduate with a B.Math.(Major) degree, by the end of January of their Third year, and submit an application for graduate studies to the Department by mid-February.

Minor in Mathematics, or in Statistics

Students registered in degree programs [excluding programs offered by the School of Mathematics and Statistics] may obtain a "Minor in Mathematics" or a "Minor in Statistics" designation on their transcript and diploma by completing the appropriate courses specified below, with a GPA of 4.0 or better over the required credits.

When applying to graduate, students who have successfully completed all requirements must inform their Registrarial Services Office if they wish to receive the "Minor in Mathematics" or the "Minor in Statistics" designation on their transcript and diploma.

Minor in Mathematics:

4.0 credits of mathematics courses required:

- i) 0.5 credit from Mathematics 69.104★, 69.107★, or 69.109★, followed by 69.207★; or 1.0 credit: Mathematics 69.102;
- ii) 0.5 credit from Mathematics 69.114★, 69.117★, or 69.119★, followed by 69.217★; or 1.0 credit: Mathematics 69.112;
- iii) 1.0 credit in Mathematics at the 200-level or above;
- iv) 1.0 credit in Mathematics at the 300-level or above (of these 4.0 credits, 2.0 must be taken at Carleton University).

Minor in Statistics:

4.0 credits of courses required:

- i) 0.5 credit from Mathematics 69.104★, 69.107★, 69.109★, or 1.0 credit: Mathematics 69.102; and 0.5 credit from Mathematics 69.114★, 69.117★, 69.119★, or 1.0 credit: Mathematics 69.112;
- ii) either (a) or (b):
 - (a) one of: Mathematics 69.257★, 69.266★, 69.352★; and one of: Mathematics 69.259★, 69.267★;
 - (b) Economics 43.220, or 1.0 credit of approved introductory statistics;

iii) Mathematics 69.353★, 69.354★, 69.357★

iv) 0.5 credit in an approved course in computer programming at the 100-level or above, i.e. Computer Science 95.105★, 95.107★, Business 42.142★, Engineering 91.166★ (of these 4.0 credits, 2.0 must be taken at Carleton University).

Graduate Programs: M.Sc. and Ph.D.

For requirements for graduate degrees, see the Calendar for the Faculty of Graduate Studies and Research.

Course Numbering

Course numbers prefixed by 70 indicate courses intended primarily for Honours students; all other courses have numbers prefixed by 69. Credit will not be given for two courses having the same number but different prefixes.

Deferred Final Examinations

In the following courses in Mathematics and Statistics, where the course is offered in two successive terms, the Deferred Final Examination will be taken in April for Fall term courses and in December for Summer Session courses. Examinations deferred from Winter term will normally take place in June: Mathematics 69.007★, 69.017★, 69.107★, 69.109★, 69.117★, 69.119★, 69.207★, 69.208★, 69.217★, 69.257★, 69.259★.

Prerequisites for First-Year Calculus and Algebra Courses

1. Pre-University Calculus:

An OAC in Calculus, or Mathematics 69.007★, or equivalent.

Students lacking an OAC in Calculus (or equivalent) must successfully complete Mathematics 69.007★ prior to taking a 100-level Calculus course. For students in any program offered by the School of Mathematics and Statistics, the above requirement of Mathematics 69.007★ is in addition to the minimum 15.0 credits in Major programs, or 20.0 credits in Honours programs.

2. Pre-University Algebra:

An OAC in Algebra and Geometry, or Mathematics 69.017★, or equivalent.

Note: An OAC in Finite Mathematics is not an equivalent.

Students lacking an OAC in Algebra and Geometry (or equivalent) must successfully complete Mathematics 69.017★ prior to taking a 100-level Algebra course.

First-Year Course Selection

1. Mathematics 69.102, 69.112 (students in the Faculties of Arts and Social Sciences, Public Affairs and Management, or Science). This choice is required of students in Firstyear who are in a Mathematics program;
2. Fall term: Mathematics 69.104★; Winter term: Mathematics 69.105★, 69.114★ (students in the Faculty of Engineering, or in Applied Physics);
3. Fall term: Mathematics 69.107★; Winter term: Mathematics 69.114★ (students in the School of Computer Science);
4. Fall term: Mathematics 69.107★; Winter term: Mathematics 69.117★ (students in the Faculty of Science);
5. Mathematics 69.102; Fall term: Mathematics 69.117★ (students in the Faculty of Science);
6. Fall term: Mathematics 69.107★, 69.117★; Winter term: Mathematics 69.207★, 69.217★ (students in the Faculties of Arts and Social Sciences, Public Affairs and Management, or Science);
7. Fall term: Mathematics 69.109★; Winter term: Mathematics 69.119★ (students in the School of Business, Department of Economics or in other Arts and Social Sciences/Public Affairs and Management departments).

Note: Credit will only be given for one of: Mathematics 69.102, 69.104★, 69.107★, 69.109★; and one of: Mathematics 69.112, 69.114★, 69.117★, 69.119★.

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Mathematics 69.007★

Introductory Calculus

Limits and continuity. Differentiation. Trigonometric, logarithmic, and exponential functions and their derivatives; curve sketching; applied problems in maxima and minima, and related rates. Not available for degree credit for students who have successfully completed an OAC in Calculus/or an equivalent High School Calculus course.

Precludes additional credit for Business 42.173.

Prerequisite: Grade 12 Mathematics (Advanced/Academic Level) or Mathematics 69.006★ or equivalent. It is strongly recommended that Mathematics 69.017★ or the equivalent be taken before 69.007★.

See Deferred Final Examinations Note, p. 350.

Lectures three hours a week and one hour tutorial.

Mathematics 69.017★

Algebra and Geometry

Vectors in the plane and in 3-space. Linear combinations and linear independence. Equations of lines and planes in space. Solution of systems of linear equations. Complex numbers (including de Moivre's Theorem, and n -th roots). Proofs by induction.

Not available for degree credit for students who have successfully completed an OAC in Algebra and Geometry/or an equivalent High School Algebra course.

Prerequisite: Grade 12 Mathematics (Advanced/Academic Level) or Mathematics 69.006★ or equivalent.

See Deferred Final Examinations Note, p. 350.

Lectures three hours a week and one hour tutorial.

Mathematics 69.102

Calculus

This course is strongly recommended for students intending to specialize in mathematics, statistics, physics, or related areas. Limits, differentiation, the definite integral, elementary functions, techniques of integration, parametric equations and polar coordinates. Improper integrals, L'Hôpital's rules, sequences and series, Taylor's formulae, introduction to differential equations.

Precludes additional credit for Mathematics 69.104★, 69.105★, 69.107★, 69.109★, 69.207★, and for 69.201, 69.202.

Prerequisites: (i) a pre-university calculus course with a grade of 65 percent or better; and (ii) an OAC in Algebra and Geometry, or Mathematics 69.017★, or permission of the School. (See Prerequisites for First-year Calculus and Algebra Courses, p. 350.)

Lectures three hours a week and one hour tutorial.

Note: Although the main prerequisite for Mathematics 69.102 is a grade of 65 percent or better in a pre-university calculus course, past experience indicates that students with less than 75 percent in their prerequisite calculus have only a small chance of success in Mathematics 69.102.

Mathematics 69.104★

Calculus for Engineering Students

The definite and indefinite integral; numerical approximation. Special functions (trigonometric and inverse trigonometric, logarithm and exponential), their derivatives and integrals. Applications: area, volume, average value. Further techniques of integration: integration by parts, partial fractions, and substitutions. Introduction to differential equations.

Restricted to students in the Faculty of Engineering, or in B.Sc.(Honours) in Applied Physics.

Precludes additional credit for Mathematics 69.102, 69.107★, 69.109★.

Prerequisite: an OAC in Calculus, or Mathematics 69.007★ (or equivalent).

Lectures three hours a week and one hour tutorial.

Mathematics 69.105★

Differential Equations and Infinite Series for Engineering Students

Further study of first-order differential equations. Linear differential equations with constant coefficients; undetermined coefficients; annihilator operators. Variation of parameters. Euler-Cauchy differential equation. Indeterminate forms. Sequences and series; convergence tests; estimation of sums. Power series; Taylor series; remainders. Use of power series to solve differential equations.

Restricted to students in the Faculty of Engineering, or in B.Sc.(Honours) in Applied Physics.

Precludes additional credit for: Mathematics 69.102, 69.201, 69.202, 69.207★, 69.244★, 70.244★ and 70.260.

Prerequisites: (i) Mathematics 69.104★, or a grade of C- or better in

69.107★; and (ii) an OAC in Algebra and Geometry, or Mathematics 69.017★; or permission of the School.

Lectures three hours a week, tutorial one hour a week.

Mathematics 69.107★

Elementary Calculus I

Definite and indefinite integrals, differentiation and integration of the elementary functions, techniques and applications of integration.

Precludes additional credit for Mathematics 69.102, 69.104★, 69.109★.

Prerequisite: an OAC in Calculus, or Mathematics 69.007★ (or equivalent).

See Deferred Final Examinations Note, p. 350.

Lectures three hours a week and one hour tutorial.

Notes:

1. Students with less than 60 percent in their pre-university calculus

course are advised that past experience indicates their chance of success in Mathematics 69.107 ★ is small.

2. A grade of C- or better in Mathematics 69.107 ★ is a prerequisite for certain 200-level Mathematics courses.

Mathematics 69.109 ★

Calculus: with Applications to Business and Economics

Definite and indefinite integrals; integration of the elementary functions; some techniques of integration. Functions of several variables; partial differentiation; constrained optimization. Selected applications in business and economics.

Precludes additional credit for Mathematics 69.102, 69.104 ★, and 69.107 ★.

Prerequisite: an OAC in Calculus, or Mathematics 69.007 ★ (or equivalent).

See Deferred Final Examinations Note, p. 350.

Lectures three hours a week and one hour tutorial.

Note: Students with less than 60 percent in their pre-university calculus course are advised that past experience indicates their chance of success in Mathematics 69.109 ★ is small.

Mathematics 69.112

Algebra

Fields, complex numbers, vector algebra and geometry in 2 and 3 dimensions, matrix algebra, linear dependence, bases, linear transformations, bilinear and quadratic forms, inner products, eigenvalues, principal axis theorem. Strongly recommended for students intending to specialize in mathematics, statistics, physics, or related areas.

Precludes additional credit for Mathematics 69.114 ★, 69.117 ★, 69.119 ★, 69.217 ★.

Prerequisites: (i) a pre-university algebra course with a grade of 65 percent or better, and (ii) an OAC in Calculus, or Mathematics 69.007 ★, or permission of the School. (See Prerequisites for First-year Calculus and Algebra Courses, p. 350.)

Lectures three hours a week and one hour tutorial.

Note: Although the main prerequisite for Mathematics 69.112 is a grade of 65 percent or better in a pre-university algebra course, past experience indicates that students with less than 75 percent in their prerequisite mathematics have only a small chance of success in Mathematics 69.112.

Mathematics 69.114 ★

Linear Algebra for Engineering and Computer Science Students

Systems of linear equations. Matrix algebra. Determinants. Complex numbers. Eigenvalues. Diagonalization and applications.

Restricted to students in the Faculty of Engineering, in the School of Computer Science, or in B.Sc.(Honours) in Applied Physics.

Precludes additional credit for Mathematics 69.112, 69.117 ★, 69.119 ★.

Prerequisite: an OAC in Algebra and Geometry, or Mathematics 69.017 ★ (or equivalent).

Lectures three hours a week and one hour tutorial.

Mathematics 69.117 ★

Linear Algebra I

Systems of linear equations; vector space of n-tuples, subspaces and bases; matrix transformations, kernel, range; matrix algebra and determinants. Inner products and orthogonality. Eigenvalues, diagonalization and applications. Emphasis throughout this course will be on the computational aspects (and not on theoretical aspects).

Precludes additional credit for Mathematics 69.112, 69.114 ★, 69.119 ★.

Prerequisite: an OAC in Algebra and Geometry, or Mathematics 69.017 ★ (or equivalent).

See Deferred Final Examinations Note, p. 350.

Lectures three hours a week and one hour tutorial.

Note: A grade of C- or better in Mathematics 69.117 ★ is a prerequisite for certain 200-level Mathematics courses.

Mathematics 69.119 ★

Linear Algebra: With Applications to Business and Economics

Algebraic concepts, systems of linear equations, vector algebra; matrix algebra, rank, inversion, determinants; linear programming — geometric approach, simplex method, etc. Applications in the fields of business and economics.

Precludes additional credit for Mathematics 69.112, 69.114 ★, 69.117 ★, and for Mathematics 69.132 ★ (Architecture 79.201 ★).

Prerequisite: An OAC in Algebra and Geometry, or Mathematics 69.017 ★ (or equivalent).

See Deferred Final Examinations Note, p. 350.

Lectures three hours a week and one hour tutorial.

Mathematics 69.185 ★

Discrete Structures I

An introduction to discrete mathematics and discrete structures.

Topics include: propositional and predicate calculus, Boolean algebra, introduction to complexity of algorithms, mathematical reasoning, counting, recurrences, relations, introduction to graphs. (Also listed as Computer Science 95.185 ★.)

This course is available to Science students only as a free option.

Prerequisites: Two OACs in Mathematics, and one of Computer Science 95.105 ★ or 95.107 ★ (which may be taken concurrently).

Lectures three hours a week.

Mathematics 69.204 ★

Multivariable Calculus for Engineering Students

Fourier series; expansions for even and odd functions; half-range expansions. Surfaces in R³. Differential calculus of functions of several variables. Extrema and Lagrange multipliers. Exact differentials. Line integrals. Double integrals; polar coordinates; applications. Triple integrals; cylindrical and spherical coordinates; applications.

Restricted to students in the Faculty of Engineering, or in B.Sc.(Honours) in Applied Physics.

Precludes additional credit for: Mathematics 69.201, 69.202, 69.208 ★, 69.209 ★ and 70.200.

Prerequisites: (i) Mathematics 69.105 ★ or 69.207 ★; and (ii) Mathematics 69.114 ★ or 69.117 ★; or permission of the School.

Lectures three hours a week, tutorial one hour a week.

Mathematics 69.207 ★

Elementary Calculus II

Further techniques of integration, improper integrals, polar coordinates, parametric equations, indeterminate forms, sequences and series, Taylor's formula and series, first order and linear differential equations.

Precludes additional credit for Mathematics 69.102, 69.105 ★, and for 69.201, 69.202.

Prerequisites: (i) Mathematics 69.104 ★, or a grade of C- or better in Mathematics 69.107 ★ or 69.109 ★; and (ii) an OAC in Algebra and Geometry, or Mathematics 69.017 ★, or permission of the School.

See Deferred Final Examinations Note, p. 350.

Lectures three hours a week and one hour tutorial.

Mathematics 69.208 ★

Intermediate Calculus

Partial differentiation, chain rule, gradient, line and multiple integrals with applications, transformations, implicit and inverse function theorems.

Precludes additional credit for Mathematics 69.204 ★, 69.209 ★, 70.200, and for 69.201, 69.202.

Prerequisites: Mathematics 69.102 or 69.207 ★, and 69.112 or 69.117 ★.

See Deferred Final Examinations Note, p. 350.

Lectures three hours a week and one hour tutorial.

Mathematics 69.209 ★

Intermediate Calculus for Science Students

Differential equations; differential calculus of functions of several variables; multiple integration; introduction to Fourier series.

Precludes additional credit for Mathematics 69.201, 69.202, 69.204 ★, 69.208 ★ and 70.200.

Prerequisites: **(i)** Mathematics 69.207 ★, or 69.102; and **(ii)** Mathematics 69.117 ★ or 69.114 ★ or 69.112; or their equivalents, or permission of the School.

Lectures three hours a week, tutorial one hour a week.

Mathematics 69.217 ★

Linear Algebra II

Finite-dimensional vector spaces (over \mathbb{R} and \mathbb{C}), subspaces, linear independence and bases. Linear transformations and matrices. Inner product spaces (over \mathbb{R} and \mathbb{C}); Orthonormal bases. Eigenvalues and diagonalization. Bilinear and quadratic forms; principal axis theorem.

Precludes additional credit for Mathematics 69.112.

Prerequisites: **(i)** Mathematics 69.114 ★, or a grade of C- or better in Mathematics 69.117 ★ or 69.119 ★; and **(ii)** a grade of C- or better in Mathematics 69.107 ★ or equivalent; or permission of the School.

See Deferred Final Examinations Note, p. 350.

Lectures three hours a week and one hour tutorial.

Mathematics 69.218 ★

Abstract Algebra I

Sets and relations, number theory, group theory, ring theory, cardinal numbers.

Precludes additional credit for Mathematics 69.311 ★ and 70.210.

Prerequisite: Mathematics 69.112 or 69.217 ★.

Lectures three hours a week and one hour tutorial.

Mathematics 69.241 ★

Mathematical Methods for Scientists

Complex numbers; phasors. Invariance principles: symmetries, rotations, translations, reflections; groups and applications. Probability and statistics with applications to experimental data. Fourier series; standard partial differential equations in science.

This course is not available for credit for students in programs offered by the School of Mathematics and Statistics.

Prerequisites: **(i)** Mathematics 69.102 (or 69.207 ★), 69.112 (or 69.217 ★); and 69.208 ★ (previously or concurrently); and **(ii)** Physics 75.101 ★ and 75.102 ★ (or a grade of B- or better in Physics 75.105).

Lectures three hours a week and one hour tutorial.

Mathematics 69.244 ★

Ordinary Differential Equations I

Ordinary differential equations; applications; special first and second order types. Linear homogeneous and non-homogeneous equations with constant coefficients; variation of parameters; simple harmonic motion. Special linear equations with variable coefficients. Series solutions about ordinary points.

Precludes additional credit for Mathematics 69.105 ★, 69.201, 69.202, 70.244 ★ and 70.260.

Prerequisites: Mathematics 69.102 and 69.112 (or 69.117 ★ and 69.207 ★).

Lectures three hours a week and one hour tutorial.

Mathematics 69.257 ★

Introduction to Statistics

Data analysis; introduction to probability theory; some standard discrete and continuous distributions such as the binomial, Poisson, hypergeometric, normal, t , and chi-square; their application to interval estimation and significance testing; simple linear regression and correlation, contingency tables; testing for goodness-of-fit. Computational aspects of statistics.

Precludes additional credit for Mathematics 69.266 ★, 69.352 ★, Economics 43.220 and Geography 45.206 ★.

Prerequisite: An OAC in Mathematics or equivalent or permission of the School.

See Deferred Final Examinations Note, p. 350.

Lectures three hours a week and one hour laboratory.

Note: See Note, p. 344, under Graduation Regulations, regarding Economics 43.220.

Mathematics 69.259 ★

Computational Statistics

Exploratory data analysis, non-parametric methods, linear regression and correlation, basic experimental designs, related topics. Computer packages are used for statistical analyses.

Precludes additional credit for Mathematics 69.267 ★, 70.259 ★, and Economics 43.220.

Prerequisites: **(i)** Mathematics 69.257 ★ and **(ii)** an OAC in Algebra and Geometry, or Mathematics 69.017 ★; or equivalents; or permission of the School.

See Deferred Final Examinations Note, p. 350.

Lectures three hours a week and one hour laboratory.

Note: See Note, p. 344, under Graduation Regulations, regarding Economics 43.220.

Mathematics 69.265 ★

Probability Models

Introductory probability theory. Introduction to stochastic modelling, Markov chains and queueing theory. Random number generation and Monte Carlo simulation. Statistical methods for fitting and evaluating models; estimation and testing. Applications to computer system performance evaluation, analysis of algorithms, reliability, search and decision problems. Restricted to students in the Bachelor of Computer Science, Computer Mathematics and Computer Statistics programs.

Precludes additional credit for Mathematics 69.352 ★, 70.260 and 70.265 ★.

Prerequisites: Mathematics 69.207 ★ (or 69.102) and 69.114 ★ (or 69.117 ★).

Lectures three hours a week and one hour tutorial.

Mathematics 69.266 ★

Business Statistics I

Introduction to statistical computing; probability concepts; descriptive statistics; estimation and testing of hypotheses. Emphasis on the development of an ability to interpret results of statistical analyses with applications from business.

Restricted to students in the School of Business.

Precludes additional credit for Mathematics 69.257 ★, 69.352 ★, Economics 43.220 and Geography 45.206 ★.

Prerequisites: either item **(iii)**; or both of items **(i)** and **(ii)**:

(i) Mathematics 69.109 ★ with a grade of C- or better; and **(ii)** an OAC in Algebra and Geometry, or Mathematics 69.017 ★; **(iii)** Business 42.173 with a grade of C- or better; or equivalents.

Lectures three hours a week and one hour laboratory.

Mathematics 69.267 ★

Business Statistics II

Topics include: experimental design, multiple regression and correlation analysis, covariance analysis, and introductory time series. Use of computer packages.

Restricted to students in the School of Business.

Precludes additional credit for Mathematics 69.259 ★, 70.259 ★ and Economics 43.220.

Prerequisite: Mathematics 69.266 ★.

Lectures three hours a week and one hour laboratory.

Mathematics 69.304 ★

Boundary Value Problems

Laplace transforms. Differential equations; solution in series; the formulation of boundary value problems in mechanics, heat conduction, etc.; the method of separation of variables; eigenfunctions and eigenvalues; Fourier series; Bessel and Legendre functions and applications. This course may be taken for credit as a 300-level Hon-

ours Mathematics course, by students in any Honours program in the School of Mathematics and Statistics.

Precludes additional credit for Mathematics 69.375 ★, Physics 75.388 ★ and 75.386.

Prerequisites: Mathematics 69.201, or 69.202; or (i) Mathematics 69.244 ★ or 69.105 ★; and (ii) Mathematics 69.204 ★ or 69.208 ★ or 69.209 ★; or permission of the School.

Lectures three hours a week and one hour tutorial.

Mathematics 69.307 ★

Functions of a Complex Variable

Analytic functions, contour integration, residue calculus, conformal mapping. Intended for non-engineering students.

Precludes additional credit for Mathematics 69.376 ★, 70.307 ★, Physics 75.387 ★ and 75.386.

Prerequisite: One of Mathematics 69.201, 69.202, 69.204 ★, 69.208 ★ or 69.209 ★, or permission of the School.

Lectures three hours a week and one hour tutorial.

Mathematics 69.309 ★

Introductory Analysis

The real number system, sequences and series, functions of a single real variable, derivatives, the definite integral, uniform convergence.

Precludes additional credit for Mathematics 70.200.

Prerequisite: One of Mathematics 69.201, 69.202, 69.204 ★, 69.208 ★, 69.209 ★, or permission of the School.

Lectures three hours a week and one hour tutorial.

Mathematics 69.311 ★

Algebraic Structures with Computer Applications

Introduction to algebraic structures: groups, rings, fields, lattices, and Boolean algebras; with applications of interest to students in Computer Science. This course may not be used to meet the 300-level course requirements in any Major or Honours program in Mathematics and Statistics.

Precludes additional credit for Mathematics 69.218 ★ and 70.210.

Prerequisite: Mathematics 69.217 ★, or permission of the School

Lectures three hours a week and one hour tutorial

Mathematics 69.317 ★

Linear Algebra III

Similarity and unitary triangularization of matrices. Direct methods of solving a system of linear equations. Iterative techniques. Bounds for eigenvalues. Power method and deflation techniques of approximation. The emphasis of the course is primarily on computational aspects.

Prerequisites: (i) a grade of C- or better in Mathematics 69.112 or 69.217 ★; and (ii) credit in Mathematics 69.102 or 69.207 ★; or permission of the School.

Lectures three hours a week and one hour tutorial.

Mathematics 69.318 ★

Abstract Algebra II

Groups and rings. Permutations. Finite symmetry groups. Polynomials, unique factorization domains. Quotient rings, ideals. Field extensions, finite fields. Polynomial equations. Geometric constructions - three famous problems: duplication of the cube; trisection of an arbitrary angle; quadrature of the circle.

Precludes additional credit for Mathematics 70.316 ★, 70.318 ★, and 70.310.

Prerequisite: Mathematics 69.218 ★, or permission of the School.

Lectures three hours a week and one hour tutorial.

Mathematics 69.325 ★

Euclidean Geometry and its Groups

Transformations of the Euclidean plane (isometries, similarities); solutions of geometric problems using these transformations; groups of symmetries of finite plane figures, frieze patterns, and regular polyhedra; inversion and the extension to the inversive plane; problems solved using inversion; orthogonal circles and pencils of coaxial circles.

Prerequisite: Mathematics 69.218 ★.

Lectures three hours a week and one hour tutorial.

Mathematics 69.326 ★

Plane Projective Geometry

Axioms of Desarguesian geometry, principle of duality; projectivities, perspectivities, and the fundamental theorem; collineations (homologies and elations); correlations (polarities and conics); algebraic model; introduction to finite projective planes.

Precludes additional credit for Mathematics 70.326 ★.

Prerequisite: Mathematics 69.218 ★.

Lectures three hours a week and one hour tutorial.

Mathematics 69.344 ★

Ordinary Differential Equations II

Series solutions of ordinary differential equations of second order about regular singular points; asymptotic solutions. Systems of ordinary differential equations of first order; matrix methods. Existence and uniqueness theorems. Nonlinear autonomous systems of order 2; qualitative theory. Numerical solutions of ordinary differential equations.

Precludes additional credit for Mathematics 70.308 ★.

Prerequisites: Mathematics 69.244 ★, 69.208 ★; and 69.112 or 69.217 ★.

Lectures three hours a week and one hour tutorial.

Mathematics 69.352 ★

Probability and Statistics

Axioms of probability; conditional probability and independence; random variables; distributions: binomial, Poisson, hypergeometric, normal, gamma; central limit theorem; sampling distributions; point estimation: maximum likelihood, and method of moments; confidence intervals; testing of hypotheses: one and two populations; engineering applications: acceptance sampling, control charts, reliability.

Restricted to students in the Faculty of Engineering, or in B.Sc.(Honours) in Applied Physics.

This course may not be used to meet the 300-level course requirements in any Major or Honours program in Mathematics and Statistics.

Precludes additional credit for Mathematics 69.257 ★, 69.265 ★, 69.266 ★, Economics 43.220 and Geography 45.206 ★.

Prerequisite: Mathematics 69.204 ★, or 69.201.

Lectures three hours a week and one hour laboratory.

Mathematics 69.353 ★

Regression Analysis

Review of simple and multiple regression with matrices, Gauss-Markov theorem, polynomial regression, indicator variables, residual analysis, weighted least squares, variable selection techniques, nonlinear regression, correlation analysis and autocorrelation. Computer packages are used for statistical analyses.

Precludes additional credit for Mathematics 70.355 ★, Economics 43.476 ★, and for Mathematics 69.351; Psychology 49.300 is precluded for additional credit for students registered in a Mathematics program.

Prerequisites: (i) Mathematics 69.259 ★ or 69.267 ★, or Economics 43.220, or equivalent; and (ii) Mathematics 69.112 or 69.117 ★ or 69.119 ★ or equivalent; or permission of the School.

Lectures three hours a week and one hour laboratory.

Mathematics 69.354 ★

Analysis of Variance and Experimental Design

Single and multifactor analysis of variance, orthogonal contrasts and multiple comparisons, analysis of covariance; nested, crossed and repeated measures designs; completely randomized, randomized block, Latin squares, factorial experiments, related topics. Computer packages are used for statistical analyses.

Precludes additional credit for Mathematics 70.355 ★, and for Mathematics 69.351; Psychology 49.300 is precluded for additional credit for students registered in a Mathematics program.

Prerequisite: Mathematics 69.353 ★ or permission of the School.
Lectures three hours a week and one hour laboratory.

Mathematics 69.357 ★

Sampling Methodology

The sample survey as a vehicle for information collection in government, business, scientific and social agencies. Topics include: planning a survey, questionnaire design, simple random, stratified, systematic and cluster sampling designs, estimation methods, problem of non-response, related topics.

Prerequisite: One of Mathematics 69.257 ★, or 69.259 ★, 69.266 ★, 69.267 ★, Economics 43.220 or equivalent; or permission of the School.

Lectures three hours a week and one hour laboratory.

Mathematics 69.358 ★

Elements of Probability Theory

Discrete and continuous distributions; moment-generating functions, marginal and conditional distributions, transformation theory, limiting distributions.

Precludes additional credit for Mathematics 69.350, 70.350, and 70.358 ★.

Prerequisites: (i) Mathematics 69.208 ★ [or one of 69.201, 69.202, 69.204 ★, or 69.209 ★]; and (ii) one of Mathematics 69.257 ★, 69.266 ★, Economics 43.220; or permission of the School.

Lectures three hours a week, tutorial one hour a week.

Mathematics 69.359 ★

Mathematical Statistics

Point and interval estimation, sufficient statistics, hypothesis testing, chi-square tests with enumeration data.

Precludes additional credit for Mathematics 69.350, 70.350, and 70.359 ★.

Prerequisite: Mathematics 69.358 ★ or permission of the School.

Lectures three hours a week, tutorial one hour a week.

Mathematics 69.375 ★

Mathematical Methods I

Laplace transforms, Fourier series and Fourier transforms, solutions of partial differential equations of mathematical physics, boundary value problems, applications.

Restricted to students in Engineering or Physics.

Precludes additional credit for Mathematics 69.304 ★, Physics 75.388 ★, and 75.386.

Prerequisite: Mathematics 69.201 or 69.202; or (i) Mathematics 69.244 ★ or 69.105 ★, and (ii) Mathematics 69.204 ★ or 69.208 ★ or 69.209 ★; or permission of the School.

Lectures three hours a week and one hour tutorial.

Mathematics 69.381 ★

Linear Programming

Formulation of linear programming problems, the simplex method, duality theory, implementations, extensions and applications. Network flow problems and the network simplex method. Precludes additional credit for Economics 43.404 ★, Engineering 94.320 ★.

Prerequisite: Mathematics 69.112 or 69.217 ★, or permission of the School.

Lectures three hours a week and one hour tutorial.

Mathematics 69.382 ★

Combinatorial Optimization

Network flow algorithms: max flow, min cost flow. Connections to linear programming. Optimal matching. Heuristic algorithms for tour problems.

Prerequisite: Mathematics 69.112 or 69.217 ★ or permission of the School.

Lectures three hours a week, tutorial one hour a week.

Mathematics 69.384 ★

Design and Analysis of Algorithms I

An introduction to the design and analysis of algorithms. Topics

include: recurrence relations, sorting and searching, divide-and-conquer, dynamic programming, greedy algorithms, amortized analysis. (Also listed as Computer Science 95.384 ★.)

Prerequisites: Computer Science 95.202 ★, and either 95.285 ★ or both of Mathematics 69.207 ★ and 69.218 ★ or equivalents.

Lectures three hours a week.

Mathematics 69.386 ★

Numerical Analysis

Elementary discussion of error, polynomial interpolation, quadrature, linear systems of equations and matrix inversion, non-linear equations, difference equations and ordinary differential equations. (Also listed as Computer Science 95.386 ★.)

Prerequisites: (i) Mathematics 69.102, 69.105 ★ or 69.207 ★ (or 69.201 or 69.202); and (ii) Mathematics 69.112 or 69.217 ★; and (iii) knowledge of a computer language.

Lectures three hours a week and one hour tutorial.

Mathematics 69.387 ★

Mathematical Software

Incorporation of basic numerical methods into efficient, reliable software. The course includes examination of existing software systems, e.g., linear systems, non-linear systems, optimization, or differential equations. (Also listed as Computer Science 95.387 ★.)

Prerequisite: Mathematics 69.386 ★.

Lectures three hours a week and one hour tutorial.

Mathematics 69.389 ★

Introduction to Number Theory and Cryptography

Congruences, distribution of primes, general cryptographic systems, public key cryptographic systems and authentication using number theory, primality testing and factoring in relation to cryptography, continued fractions and diophantine equations.

Prerequisites: Mathematics 69.218 ★ or 69.311 ★ or 70.210; knowledge of a computer language.

Lectures three hours a week and one hour tutorial.

Mathematics 69.397 ★

Directed Studies

Available only to students whose program requires a 0.5 credit not offered by the School of Mathematics and Statistics.

Mathematics Courses for Honours Students

Mathematics 70.200

Calculus and Introductory Analysis

Higher dimensional calculus, chain rule, gradient, line and multiple integrals with applications. Use of implicit and inverse function theorems. Real number axioms, limits, continuous functions, differentiability, infinite series, uniform convergence, the Riemann integral.

Precludes additional credit for Mathematics 69.204 ★, 69.208 ★, 69.209 ★, 69.309 ★, and for 69.201, 69.202.

Prerequisites: (i) Mathematics 69.102 or 69.207 ★; and (ii) Mathematics 69.112 or 69.117 ★; or permission of the School.

Lectures three hours a week and one hour tutorial.

Mathematics 70.210

Algebra

Set theory, algebraic systems, vector spaces, inner product spaces, linear transformations, determinants, quadratic forms, selected applications.

Precludes additional credit for Mathematics 69.218 ★ or 69.311 ★.

Prerequisite: Mathematics 69.112 or 69.217 ★.

Lectures three hours a week and one hour tutorial.

Mathematics 70.220 ★

Co-operative Work Term Report 1

On completion of the work term, the student must submit to the School of Mathematics and Statistics a written report on the work performed. Graded *Sat* or *Uns*.

Prerequisites: Registration in the Co-operative Education Option

of an Honours program offered by the School of Mathematics and Statistics, and permission of the School.

Mathematics 70.244 ★

Ordinary Differential Equations

Ordinary differential equations of the first and second order, existence and uniqueness of solutions; numerical solutions, error analysis; linear systems of first order; difference equations; higher order linear equations. Modelling with differential equations. A mathematical computer software package will be used.

Precludes additional credit for Mathematics 69.105 ★, 69.201, 69.202, 69.244 ★, 70.260.

Prerequisites: Mathematics 69.102 (or 69.207 ★) and 69.112 (or 69.217 ★).

Lectures three hours a week, tutorial one hour a week.

Mathematics 70.259 ★

Statistics: Theory and Practice

Computational and inferential statistics; basic distributions (normal, t , chi-square, F); maximum likelihood and moment estimators; properties of estimators; confidence intervals (one- and two-sample procedures); testing of simple and composite hypotheses; regression and analysis of variance models; non-parametric procedures; contingency tables. Use of computer packages.

Precludes additional credit for Mathematics 69.259 ★, 69.267 ★, Economics 43.220.

Prerequisite: Mathematics 70.265 ★ or 70.260.

Lectures three hours a week and one hour tutorial/laboratory.

Mathematics 70.265 ★

Introduction to Probability with Applications

Axioms of probability; basic combinatorial analysis, conditional probability and independence, discrete and continuous random variables, joint and conditional distributions, expectation, central limit theorem, sampling distributions, simulation and applications to descriptive statistics. A statistical software package will be used.

Precludes additional credit for Mathematics 69.265 ★ and 70.260.

Prerequisites: Mathematics 69.102 (or 69.207 ★) and 69.112 (or 69.217 ★).

Lectures three hours a week, tutorial one hour a week.

Mathematics 70.297 ★

Directed Studies

Available only to Honours students whose program requires a 0.5 credit not offered by the School of Mathematics and Statistics.

Mathematics 70.301 ★

Real Analysis

Metric spaces; limits, continuity, open and closed sets, compactness, connectedness and completeness. Uniform convergence of sequences of functions, as convergence in metric spaces of bounded and continuous functions. Weierstrass approximation theorem. Contraction mappings and applications to integral and differential equations.

Prerequisite: Mathematics 70.200 or permission of the School.

Lectures three hours a week and one hour tutorial.

Mathematics 70.302 ★

Advanced Calculus

Vector fields on surfaces. The functions div , curl and grad . Line and surface integrals. The divergence theorem and Stokes' theorem. Exterior algebra. Stokes' formula. Functions of bounded variation. The Riemann-Stieltjes integral.

Prerequisite: Mathematics 70.200 or permission of the School.

Lectures three hours a week and one hour tutorial.

Mathematics 70.307 ★

Functions of a Complex Variable

Analytic functions, contour integration, residue calculus, conformal mapping. Precludes additional credit for Mathematics 69.307 ★, 69.376 ★, Physics 75.387 ★, and 75.386.

Prerequisite: Mathematics 70.200 or permission of the School. Lectures three hours a week and one hour tutorial.

Mathematics 70.308 ★

Ordinary Differential Equations

Analytic ordinary differential equations: series solutions of ordinary differential equations about ordinary and regular singular points. Asymptotic solutions. Sturm-Liouville theory. Bessel and Legendre functions. Fourier series.

Precludes additional credit for Mathematics 69.344 ★, Physics 75.388 ★, and 75.386.

Prerequisites: Mathematics 70.200; and 70.244 ★ or 70.260.

Lectures three hours a week and one hour tutorial.

Mathematics 70.316 ★

Introduction to Group Theory

Homomorphism theorems; groups acting on sets; permutation groups and groups of matrices; Sylow theory for finite groups; finitely generated abelian groups; generators and relations; applications.

Precludes additional credit for Mathematics 70.310 and 69.318 ★.

Prerequisite: Mathematics 70.210, or permission of the School.

Lectures three hours a week, tutorial one hour a week.

Mathematics 70.318 ★

Rings and Fields

Rings; integral domains; Euclidean and principal ideal domains; polynomial rings over a field; modules over principal ideal domains and applications; fields; algebraic extensions of fields; finite fields; applications.

Precludes additional credit for Mathematics 70.310 and 69.318 ★.

Prerequisite: Mathematics 70.210, or permission of the School.

Lectures three hours a week, tutorial one hour a week.

Mathematics 70.320 ★

Co-operative Work Term Report 2

On completion of the work term, the student must submit to the School of Mathematics and Statistics a written report on the work performed. Graded *Sat* or *Uns*.

Prerequisites: Registration in the Co-operative Education Option of an Honours program offered by the School of Mathematics and Statistics, and permission of the School.

Mathematics 70.321 ★

Co-operative Work Term Report 3

On completion of the work term, the student must submit to the School of Mathematics and Statistics a written report on the work performed. Graded *Sat* or *Uns*.

Prerequisites: Registration in the Co-operative Education Option of an Honours program offered by the School of Mathematics and Statistics, and permission of the School.

Mathematics 70.326 ★

Foundations of Projective Geometry

Definition of a general projective plane and immediate consequences; finite planes (combinatorial results, sub-planes, incidence matrices) and planar ternary rings; collineations, role of Desargues' configuration, examples of types of planes.

Precludes additional credit for Mathematics 69.326 ★.

Prerequisite: Mathematics 70.210.

Lectures three hours a week and one hour tutorial.

Mathematics 70.336 ★

Elements of Set Theory

Axioms of set theory. Development of the systems of natural numbers and the real numbers. Axiom of choice, Zorn's lemma, well-ordering. The Schröder-Bernstein theorem, cardinal numbers, ordinal numbers, transfinite induction, cardinal and ordinal arithmetics.

Prerequisite: Mathematics 70.210 or permission of the School.

Lectures three hours a week and one hour tutorial.

Mathematics 70.346 ★

Autonomous Dynamical Systems

Basic concepts of dynamical systems. Stability; limit cycles; Lyapunov's direct method. Theory of autonomous dynamical systems. Volterra systems; principle of competitive exclusion in population biology. The threshold theorem of epidemiology. Basic concepts of nonequilibrium statistical mechanics.

Prerequisites: Mathematics 70.200; and 70.244 ★ or 70.260.

Lectures three hours a week and one hour tutorial.

Mathematics 70.355 ★

Regression and Experimental Design

Linear regression - theory and methods; design of experiments - analysis of the completely randomized, randomized block and Latin square designs; multiple comparisons; factorial experiments; related topics.

Precludes additional credit for Mathematics 69.353 ★, 69.354 ★, Economics 43.476 ★, and for Mathematics 69.351. Psychology 49.300 is precluded for additional credit for students registered in a Mathematics program.

Prerequisites: (i) Mathematics 70.259 ★ or 69.259 ★; and (ii) 69.112 or 69.217 ★; and (iii) 70.359 ★ or 69.359 ★ (which may be taken concurrently); or permission of the School.

Lectures three hours a week and one hour laboratory.

Mathematics 70.356 ★

Stochastic Processes and Queueing Theory

Stochastic modelling, Markov chains, birth and death processes, renewal theory. Queueing theory: analytical and simulation methods. Applications to computer systems, operations research and social sciences.

Prerequisites: Mathematics 70.265 ★ or 70.260; or a GPA of 6.0 or better over the three courses Mathematics 69.207 ★, 69.217 ★ (or 69.112), and 69.265 ★; or permission of the School.

Lectures three hours a week and one hour tutorial.

Mathematics 70.358 ★

Elements of Probability Theory

Random variables and moment-generating functions, concepts of conditioning and correlation; laws of large numbers, central limit theorem; multivariate normal distribution; distributions of functions of random variables, sampling distributions, order statistics. Precludes additional credit for Mathematics 69.358 ★, 69.350, 70.350.

Prerequisites: (i) Mathematics 70.265 ★ (or 69.265 ★ or 70.260); and (ii) Mathematics 70.200 (or a grade of C+ or better in 69.208 ★); or permission of the School.

Lectures three hours a week, tutorial one hour a week.

Mathematics 70.359 ★

Mathematical Statistics

Empirical distribution functions, Monte Carlo methods, elements of decision theory, point estimation, interval estimation, tests of hypotheses, robustness, nonparametric methods.

Precludes additional credit for Mathematics 69.350, 69.359 ★, 70.350.

Prerequisite: Mathematics 70.358 ★ or permission of the School.

Lectures three hours a week, tutorial one hour a week.

Mathematics 70.385 ★

Discrete Structures and Applications

Enumeration: elementary methods, inclusion and exclusion, recurrence relations, generating functions and applications. Graph theory and algorithms: connectivity, planarity, Hamilton and Euler paths.

Error-correcting codes. (Also listed as Computer Science 95.385 ★.)

Prerequisite: One of Mathematics 69.218 ★, 69.311 ★, or 70.210.

Lectures three hours a week and one hour tutorial.

A selection of courses in the 400 series will be offered.

Mathematics 70.403 ★

Functional Analysis

Banach spaces and bounded linear operators, Hahn-Banach exten-

sion and separation, dual spaces, bounded inverse theorems, uniform boundedness principle, applications. Compact operators. Differential calculus in Banach spaces, inverse and implicit function theorems and their application to differential equations. Also offered at the graduate level, with additional or different requirements, as Mathematics 70.508, for which additional credit is precluded.

Prerequisite: Mathematics 70.301 ★ or permission of the School. Lectures three hours a week.

Mathematics 70.407 ★

Measure and Integration Theory

Lebesgue measure and integration on the real line; sigma algebras and measures; integration theory; L_p spaces; Fubini's theorem; decomposition theorems and Radon-Nikodym derivatives. Also offered at the graduate level, with additional or different requirements, as Mathematics 70.507, for which additional credit is precluded.

Prerequisite: Mathematics 70.301 ★ or 70.302 ★ or permission of the School.

Lectures three hours a week.

Mathematics 70.415 ★

Rings and Modules

Fundamental concepts in rings and modules, structure theorems, applications.

Prerequisite: Mathematics 70.318 ★ or 70.310 or permission of the School.

Lectures three hours a week.

Mathematics 70.416 ★

Group Theory

Fundamental principles as applied to abelian, nilpotent, solvable, free and finite groups; representations. Also offered at the graduate level, with additional or different requirements, as Mathematics 70.516, for which additional credit is precluded.

Prerequisite: Mathematics 70.316 ★ or 70.310 or permission of the School.

Lectures three hours a week.

Mathematics 70.417 ★

Commutative Algebra

Fields, including algebraic and transcendental extensions, Galois theory, valuation theory; Noetherian commutative rings, including Noether decomposition theorem and localization.

Prerequisite: Mathematics 70.318 ★ or 70.310 or permission of the School.

Lectures three hours a week.

Mathematics 70.418 ★

Homological Algebra and Category Theory

Axioms of set theory; categories, functors, natural transformations; free, projective, injective and flat modules; tensor products and homology functors, derived functors; dimension theory. Also offered at the graduate level, with additional or different requirements, as Mathematics 70.518, for which additional credit is precluded.

Prerequisite: Mathematics 70.318 ★ or 70.310 or permission of the School.

Lectures three hours a week.

Mathematics 70.419 ★

Fields and Coding Theory

Introduction to field theory, emphasizing the structure of finite fields, primitive elements and irreducible polynomials. The influence of computational problems will be considered. Theory and applications of error-correcting codes: algebraic codes, convolution codes, decoding algorithms, and analysis of code performance.

Prerequisite: Mathematics 70.210, or 69.311 ★ or 69.218 ★ or equivalent; or permission of the School.

Lectures three hours a week.

Mathematics 70.420 ★

Co-operative Work Term Report 4

On completion of the work term, the student must submit to the School of Mathematics and Statistics a written report on the work performed. Graded *Sat* or *Uns*.

Prerequisites: Registration in the Co-operative Education Option of an Honours program offered by the School of Mathematics and Statistics, and permission of the School.

Mathematics 70.421 ★

Co-operative Work Term Report 5

On completion of the work term, the student must submit to the School of Mathematics and Statistics a written report on the work performed. Graded *Sat* or *Uns*.

Prerequisites: Registration in the Co-operative Education Option of an Honours program offered by the School of Mathematics and Statistics; and permission of the School.

Mathematics 70.425 ★

Introduction to General Topology

Topological spaces, maps, subspaces, product and identification topologies, separation axioms, compactness, connectedness. Also offered at the graduate level, with additional or different requirements, as Mathematics 70.525, for which additional credit is precluded.

Prerequisite: Mathematics 70.301 ★ or permission of the School. Lectures three hours a week.

Mathematics 70.426 ★

Introduction to Algebraic Topology

An introduction to homotopy theory. Topics include the fundamental group, covering spaces and the classification of two-dimensional manifolds. Also offered at the graduate level, with additional or different requirements, as Mathematics 70.526, for which additional credit is precluded.

Prerequisites: Mathematics 70.316 ★ (or 70.310) and 70.425 ★; or permission of the School.

Lectures three hours a week.

Mathematics 70.427 ★

Foundations of Geometry

A study of at least one modern axiom system of Euclidean and non-Euclidean geometry, embedding of hyperbolic and Euclidean geometries in the projective plane, groups of motions, models of non-Euclidean geometry.

Prerequisite: Mathematics 70.316 ★ (may be taken concurrently) or 70.310, or permission of the School.

Lectures three hours a week.

Mathematics 70.428 ★

Introduction to Differentiable Manifolds

A study of differentiable manifolds from the point of view of either differential topology or differential geometry. Topics such as smooth mappings, transversality, intersection theory, vector fields on manifolds, Gaussian curvature, Riemannian manifolds, differential forms, tensors and connections are included.

Prerequisite: Mathematics 70.301 ★ or permission of the School. Lectures three hours a week.

Mathematics 70.435 ★

Analytic Number Theory

Dirichlet series, characters, Zeta-functions, prime number theorem, Dirichlet's theorem on primes in arithmetic progressions, binary quadratic forms. Also offered at the graduate level, with additional or different requirements, as Mathematics 70.535, for which additional credit is precluded.

Prerequisite: Mathematics 70.307 ★ or permission of the School. Lectures three hours a week.

Mathematics 70.436 ★

Algebraic Number Theory

Algebraic number fields, bases, algebraic integers, integral bases, arithmetic in algebraic number fields, ideal theory, class number. Also offered at the graduate level, with additional or different requirements, as Mathematics 70.536, for which additional credit is precluded.

Prerequisite: Mathematics 70.318 ★ (may be taken concurrently) or 70.310, or permission of the School.

Lectures three hours a week.

Mathematics 70.447 ★

Tensor Analysis and Relativity Theory

Development of tensor analysis, application to Riemannian spaces and relativity theory.

Prerequisites: Mathematics 70.345 ★ and 70.346 ★ or permission of the School.

Lectures three hours a week.

Mathematics 70.450 ★

Parametric Estimation

Preliminaries on probability theory; exact and asymptotic sampling distributions; unbiasedness, consistency, efficiency, sufficiency and completeness; properties of maximum likelihood estimators; least squares estimation of location and scale parameters based on order statistics and sample quantiles; Best Asymptotically Normal (BAN) estimators. Also offered at the graduate level, with additional or different requirements, as Mathematics 70.560, for which additional credit is precluded.

Prerequisite: Mathematics 70.350 or 70.359 ★ or permission of the School.

Lectures three hours a week.

Mathematics 70.451 ★

Probability Theory

Introduction to probability, characteristic functions, probability distributions, limit theorems.

Prerequisites: Mathematics 70.356 ★ and 70.358 ★ or permission of the School.

Lectures three hours a week.

Mathematics 70.452 ★

Survey Sampling

Basic concepts in sampling from finite populations; simple random sampling; stratified sampling; choice of sampling unit; cluster and systematic sampling; introduction to multistage sampling; ratio estimation; sampling with unequal probabilities and with replacement; replicated sampling; related topics.

Prerequisites: (i) Mathematics 70.259 ★ or 69.259 ★; and (ii) either 70.359 ★ (or 70.350) or a grade of C+ or better in 69.359 ★ (or 69.350); or permission of the School.

Lectures three hours a week.

Mathematics 70.453 ★

Applied Multivariate Analysis

Selected topics in regression and correlation non-linear models. Multivariate statistical methods, principal components, factor analysis, multivariate analysis of variance, discriminant analysis, canonical correlation, analysis of categorical data. Also offered at the graduate level, with additional or different requirements, as Mathematics 70.559, for which additional credit is precluded.

Prerequisites: Mathematics 70.355 ★; or 69.359 ★ (or 69.350) and 69.354 ★; or permission of the School.

Lectures three hours a week.

Mathematics 70.456 ★

Non-Parametric Methods

Order statistics; rank statistics; permutations; asymptotics; hypothesis of randomness; stochastic ordering; Wilcoxon test; median test; Kolmogorov-Smirnov test; hypothesis of symmetry and random blocks; independence hypothesis; treatment of ties; power

and efficiency. Also offered at the graduate level, with additional or different requirements, as Mathematics 70.556, for which additional credit is precluded.

Prerequisite: Mathematics 70.359 ★ (or 70.350) or permission of the School.

Lectures three hours a week.

Mathematics 70.457 ★

Statistical Inference

Sufficient statistics, simple and composite hypotheses, most powerful and similar region test, distribution-free tests, confidence intervals, goodness-of-fit and likelihood ratio tests, large sample theory, Bayesian and likelihood methods, sequential tests. Also offered at the graduate level, with additional or different requirements, as Mathematics 70.551, for which additional credit is precluded.

Prerequisite: Mathematics 70.450 ★ or permission of the School.

Lectures three hours a week.

Mathematics 70.458 ★

Stochastic Models

Review of discrete Markov chains and Poisson processes; pure jump Markov processes including the Q-matrix approach; the Kolmogorov equations; classification of states; stationary and limiting distributions; renewal theory. Also offered at the graduate level, with additional or different requirements, as Mathematics 70.571, for which additional credit is precluded.

Prerequisite: Mathematics 70.356 ★ or permission of the School.

Lectures three hours a week.

Mathematics 70.459 ★

Advanced Mathematical Modelling

Real life situations in the physical, social, and life sciences are often modelled using mathematical tools. This course will examine various models and techniques used in their analysis, e.g., matrix procedures in connection with population models. Students will use a computer package to obtain numerical results. Also offered at the graduate level, with additional or different requirements, as Mathematics 70.561, for which additional credit is precluded.

Prerequisites: Mathematics (i) 70.244 ★ and 70.265 ★ (or 70.260; or 69.244 ★ and 69.265 ★) and (ii) 70.356 ★; or permission of the School.

Lectures three hours a week.

Mathematics 70.460 ★

Case Studies in Operations Research

Applications of the principles of Operations Research to practical problems in business, management, and science. Students present at least one case and analyze cases in the published literature. Cases may also be presented by visiting practitioners.

Note: this course is designed for students in their final year in Honours Operations Research. Students in Honours Mathematics/Statistics programs may only take this course as a free option.

Prerequisites: Mathematics 69.259 ★ (or 70.259 ★) and 69.381 ★; or permission of the School.

Seminars three hours a week.

Mathematics 70.470 ★

Partial Differential Equations

First order linear, quasi-linear, and non-linear equations; second order equations in two and more variables; systems of equations; the wave equation; Laplace and Poisson equations, Dirichlet and Neumann problems; Green's functions. Also offered at the graduate level, with additional or different requirements, as Mathematics 70.546, for which additional credit is precluded.

Prerequisites: Mathematics 70.308 ★ and one of 70.302 ★ or 70.307 ★ or permission of the School.

Lectures three hours a week.

Mathematics 70.471 ★

Topics in Partial Differential Equations

Theory of distributions, initial-value problems based on 2-dimensions wave equations, Laplace transform, Fourier integral transform, diffusion problems, Helmholtz equation with application to boundary and initial-value problems in cylindrical and spherical coordinates. Also offered at the graduate level, with additional or different requirements, as Mathematics 70.547, for which additional credit is precluded.

Prerequisites: Mathematics 70.308 ★ and one of 70.302 ★ or 70.307 ★ or permission of the School.

Lectures three hours a week.

Mathematics 70.472 ★

Integral Transforms

Laplace, Fourier, Hankel and Mellin transforms, selection of a suitable transform for a given partial differential equation boundary value problem. Operational properties of transforms. Inversion theorems. Approximate evaluation of inversion integrals for small and large values of parameter. Application to the solution of integral equations.

Prerequisite: Mathematics 70.307 ★ or permission of the School.

Lectures three hours a week.

Mathematics 70.473 ★

Qualitative Theory of Ordinary Differential Equations

Ordinary differential equations: existence-uniqueness theorems, vector formulation for systems; stability theory, Lyapunov theorems, perturbation theorems and structural stability; Poincaré-Bendixon theory.

Prerequisites: Mathematics 70.301 ★, 70.308 ★, 70.346 ★.

Lectures three hours a week.

Mathematics 70.481 ★

Topics in Combinatorics

An in-depth study of one or more topics from: generating functions, Polya's theory of counting, block designs, coding theory, partially ordered sets and Ramsey theory.

Prerequisites: Mathematics 70.210 and 70.385 ★ or permission of the School.

Lectures three hours a week.

Mathematics 70.482 ★

Introduction to Mathematical Logic

Symbolic logic, propositional and predicate calculi, set theory and model theory, completeness.

Prerequisite: Mathematics 70.210 or permission of the School.

Lectures three hours a week.

Mathematics 70.483 ★

Computable Functions

Recursive functions and computability, algorithms, Church's thesis, Turing machines, computational logic, NP-completeness. (Also listed as Computer Science 95.483 ★.)

Prerequisite: Mathematics 70.210 or 70.385 ★ or permission of the School.

Lectures three hours a week.

Mathematics 70.485 ★

Theory of Automata

Finite automata and regular expressions, properties of regular sets, context-free grammars, pushdown automata, deterministic context-free languages. Turing machines, the Chomsky hierarchy. Undecidability, intractable problems. Also offered at the graduate level, with additional or different requirements, as Mathematics 70.565, for which additional credit is precluded. (Also listed as Computer Science 95.485 ★.)

Prerequisite: Mathematics 70.385 ★ or 70.316 ★ or 70.318 ★ (or 70.310) or permission of the School.

Lectures three hours a week.

Mathematics 70.486 ★

Numerical Linear Algebra

Study of matrix inversion techniques; techniques of finding eigenvalues and eigenvectors, solution of systems of linear equations; direct and indirect methods, their comparison and error analysis; applications in optimization and other areas. (Also listed as Computer Science 95.486 ★.)

Prerequisites: Mathematics 69.112 or 69.217 ★; and Mathematics 70.200 or 69.309 ★, or permission of the School.

Lectures three hours a week.

Mathematics 70.488 ★

Graph Theory and Algorithms

Paths, circuits, Eulerian and Hamiltonian graphs, connectivity, colouring problems, matching, Ramsey theory, network flows.

Prerequisites: Mathematics 70.385 ★ or 70.316 ★ or 70.318 ★ (or 70.310) or permission of the School.

Lectures three hours a week.

Mathematics 70.493 ★

Honours Project

Consists of a written report on some approved topic or topics in the field of statistics, with a substantial computer component. The written report should consist of 15 to 30 pages, plus documentation.

Prerequisite: Registration in the Honours Computer Statistics program; see p. 346.

Mathematics 70.494 ★

Honours Project

Consists of a written report on the investigation and implementation of mathematical software, including a description of both the theoretical background and of the implementation, and documentation of the implementation. The written report should consist of 15 to 30 pages, plus documentation.

Prerequisite: Registration in the Honours Computer Mathematics program (Information Technology stream); see p. 345.

Mathematics 70.495 ★

Honours Project

Consists of a written report on some approved topic or topics in the field of mathematics, together with a short lecture on the report.

Prerequisite: B.Math.(Honours) students only, see p. 345.

Mathematics 70.496 ★

Directed Studies

Prerequisite: B.Math.(Honours) students only.

Mathematics 70.497 ★

Directed Studies

Prerequisite: B.Math.(Honours) students only.

The following courses have not been offered in recent years, but may be offered sometime in the future:

Mathematics 69.376 ★ Mathematical Methods II

Mathematics 70.345 ★ Classical Mechanics

Mathematics 70.390 ★ Mathematical Problem Solving

Mathematics 70.401 ★ Vector Calculus

Mathematics 70.445 ★ Analytical Dynamics

Mathematics 70.446 ★ Hydrodynamics and Elasticity

Mathematics 70.487 ★ Game Theory

Mechanical and Aerospace Engineering (Engineering)

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Academic Administration

Chair, Robert Bell

Teaching Staff

Professors Emeriti

J.T. Rogers, B.Eng., M.Eng., Ph.D. (McGill), F.C.S.M.E., P.Eng. • **H.I.H. Saravanamuttoo**, B.Sc. (Glasgow), Ph.D. (Bristol), F.C.A.S.I., F.I.Mech.E., F.A.S.M.E., P.Eng.

Professors

F.F. Afagh, B.Sc., M.Sc. (Washington State), Ph.D. (Waterloo), P.Eng. • **R. Bell**, B.Sc., Ph.D. (Queen's of Belfast), P.Eng. • **M.J. Bibby**, M.Sc., Ph.D. (Alberta), P.Eng. • **J. A. Goldak**, B.Sc., M.Sc., Ph.D. (Alberta), P.Eng. • **R.J. Kind**, B.Sc. (Loyola), B.Eng. (McGill), Ph.D. (Cambridge), P.Eng. • **M.J. McDill**, B.Eng., M.Eng., Ph.D. (Carleton), P.Eng. • **E.G. Plett**, B.A.Sc. (British Columbia), S.M., Sc.D. (Massachusetts Institute of Technology), P.Eng. • **J.Z. Sasiadek**, B.Sc. (Warsaw), M.Sc., D.Sc., Ph.D. (Wroclaw), Ing., P.Eng. • **S.A. Sjolander**, B.Eng., M.Eng. (Carleton), Ph.D. (Cambridge), P.Eng. • **D.A. Staley**, B.Sc. (British Columbia), M.A. (Toronto), Ph.D. (Western Ontario) • **P.V. Straznicky**, Dipl.Ing. (Brno), M.Eng. (Toronto), P.Eng. • **C.L. Tan**, B.Sc., Ph.D. (London) • **J-Y Wong**, B.Sc. (Tsing Hua), Ph.D., D.Sc. (Newcastle-upon-Tyne), F.I.Mech.E., F.A.S.M.E., P.Eng., C. Eng.

Associate Professors

J.C. Beddoes, B.Eng., M.Eng., Ph.D. (Carleton), P.Eng. • **F.W. Black**, B.Sc. (M.E.) (Manitoba), M.A.Sc., Ph.D. (Toronto), P.Eng. • **W.G. Richarz**, B.A.Sc., M.A.Sc., Ph.D. (Toronto), P.Eng. • **D.L. Russell**, B.Eng. (Technical University of Nova Scotia), M.S., Ph.D. (Massachusetts Institute of Technology) • **M.I. Yaras**, B.Sc. (Technical University of Istanbul), M.Eng., Ph.D. (Carleton)

Assistant Professors

A.V. Artemev, M.Sc., Ph.D. (Moscow) • **J.A. Gaydos**, B.A.Sc., M.A.Sc., Ph.D. (Toronto) • **A.K. Pilkey**, B.A.Sc., M.A.Sc. (Waterloo), Ph.D. (Carleton)

Adjunct Research Professors

P.R. Frise, University of Windsor • **K.R. Goheen**, Yorkton Securities • **E.S. Hanff**, National Research Council • **C.H. Hersom**, Institute for Space and Terrestrial Sciences • **A. Jablonski**, Canadian Space Agency • **A.K. Koul**, National Research Council • **N.B. McLaughlin**, Agriculture and Agri-food Canada • **J.J. McPhee**, University of Waterloo • **H. Moustapha**, Pratt & Whitney Canada • **T. Mussivand**, University of Ottawa Heart Institute • **F. Nitzsche**, National Research Council • **J. Sinkiewicz**, M.I.T. • **F. Vigneron**, Canadian Space Agency • **G. Vukovich**, Canadian Space Agency • **W. Wallace**, National Research Council • **M.J. Worswick**, University of Waterloo • **J.S. Zhang**, National Research Council

Adjunct Professors

M.C. deMalherbe • **G. Kardos** • **James Kirkhope** • **J.T. Rogers**

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Mechanical and Aerospace Core Courses

Engineering 86.201 ★

Engineering Graphics and Design

Engineering drawing techniques; fits and tolerances; working drawings; fasteners. Elementary descriptive geometry; true length, true view, and intersection of geometric entities; developments. Assignments will make extensive use of Computer-Aided Design (CAD) and will include the production of detail and assembly drawings from actual physical models.

Precludes additional credit for Engineering 91.101 ★.

Prerequisite: Engineering 91.100 ★.

Lectures and tutorials two hours a week, laboratory four hours a week.

Engineering 86.211 ★

Engineering Dynamics

Review of kinematics and kinetics of particles: rectilinear and curvilinear motions; Newton's second law; energy and momentum methods. Kinematics and kinetics of rigid bodies: plane motion of rigid bodies; forces and accelerations; energy and momentum methods.

Precludes additional credit for Engineering 82.211 ★ or Engineering 91.211 ★.

Prerequisites: Engineering 91.111 ★ and Mathematics 69.105 ★ and 69.114 ★.

Lectures three hours a week, problem analysis three hours a week.

Engineering 86.222 ★

Mechanics of Solids I

Review of Principles of Statics; friction problems; Concepts of stress and strain at a point; Statically determinate and indeterminate stress systems; Torsion of circular sections; Bending moment and shear force diagrams; Stresses and deflections in bending; Stress and strain transformations; Buckling instability.

Precludes additional credit for Engineering 82.220 ★.

Prerequisites: Engineering 91.111 ★, Mathematics 69.105 ★ and 69.114 ★.

Lectures three hours a week, problem analysis and laboratory three hours a week.

Engineering 86.230 ★

Fluid Mechanics I

Fluid properties. Units. Kinematics, dynamics of fluid motion: concepts of streamline, control volume, steady and one-dimensional flows; continuity, Euler, Bernoulli, steady flow energy, momentum, moment of momentum equations; applications. Fluid statics; pressure distribution in fluid at rest; hydrostatic forces on plane and curved surfaces; buoyancy.

Prerequisites: Mathematics 69.105 ★, 69.114 ★ and Engineering 91.111 ★.

Lectures three hours a week, laboratory and problem analysis three hours a week.

Engineering 86.240 ★

Thermodynamics and Heat Transfer

Basic concepts of thermodynamics: temperature, work, heat, internal energy and enthalpy. First law of thermodynamics for closed and steady-flow open systems. Thermodynamic properties of pure substances; changes of phase; equation of state. Second law of thermodynamics: concept of entropy. Simple power and refrigeration cycles. Introduction to heat transfer: conduction, convection and radiation.

Precludes additional credit for Engineering 91.241 ★.

Prerequisites: Chemistry 65.111 ★, Mathematics 69.105 ★ and 69.114 ★.

Lectures three hours a week, laboratory and problem analysis three hours a week.

Engineering 86.270 ★

An Introduction to Engineering Materials

Materials (metals, alloys, polymers) in engineering service; relationship of interatomic bonding, crystal structure and defect structure (vacancies, dislocations) to material properties; polymers, thermoplastic, thermosetting; phase diagrams and alloys; microstructure control (heat treatment) and mechanical properties; material failure. Precludes additional credit for Engineering 88.271 ★ or 82.270 ★.

Prerequisites: Chemistry 65.111 ★ and Engineering 82.220 ★ or 86.222 ★. Concurrent registration with 86.222 ★ is also permitted.

Lectures three hours a week, problem analysis and laboratory three hours a week.

Engineering 86.304 ★

Dynamics of Machinery

Kinematic and dynamic analysis of mechanisms and machines. Instant Centres and complex algebra techniques. Synthesis of mechanisms. Kinematics and Dynamics of Cams. Design and analysis considerations in reciprocating and rotating machinery. Vibrations in machinery. Vibration isolation. Experimental investigation of dynamic systems.

Prerequisite: Engineering 86.211 ★.

Lectures three hours a week, problem analysis and laboratories one hour a week.

Engineering 86.322 ★

Mechanics of Solids II

Torsion of non-circular sections; Unsymmetric bending and shear centre; Energy methods; Complex stresses and criteria of yielding; Elementary theory of elasticity; Axisymmetric deformations; Elementary plasticity analysis; Plastic collapse.

Precludes additional credit for Engineering 82.322 ★.

Prerequisite: Engineering 86.222 ★.

Lectures three hours a week, problem analysis and laboratory three hours a week.

Engineering 86.330 ★

Fluid Mechanics II

Review of control volume analysis. Dimensional analysis and similitude. Compressible flow: isentropic flow relations, flow in ducts and nozzles, effects of friction and heat transfer, normal and oblique shocks, two-dimensional isentropic expansion. Viscous flow theory: hydrodynamic lubrication and introduction to boundary layers.

Precludes additional credit for Engineering 86.333 ★.

Prerequisites: Mathematics 69.204 ★ and Engineering 86.230 ★.

Lectures three hours a week, problem analysis and laboratory three hours a week.

Engineering 86.340 ★

Applied Thermodynamics

Gas and vapour power cycles: reheat, regeneration, combined gas/vapour cycles, cogeneration. Heat pump and refrigeration cycles: vapour compression cycles, absorption refrigeration and gas refrigeration. Mixtures of perfect gases and vapours: psychrometry and combustion. Principles of turbomachinery.

Prerequisite: Engineering 86.240 ★.

Lectures three hours a week, problem analysis and laboratories one hour a week.

Engineering 86.391 ★

Mechanical and Aerospace Engineering Laboratory

Students perform a series of laboratory exercises dealing with a wide range of mechanical engineering topics. Students relate theory and practice and develop experience with modern engineering equipment and measurement techniques. Good reporting practice is emphasized.

Precludes additional credit for Engineering 86.491 ★.

Prerequisite: Third-year registration.

Lectures and tutorials one hour a week, laboratory five hours a week.

Engineering 86.412 ★

Engineering Materials: Strength and Fracture

Analysis and prevention of failures in metals and composite materials; micro-mechanisms of fracture, conditions leading to crack growth. Mechanisms of fracture and transition temperature effects, fracture mechanics, fatigue, environmentally assisted cracking, non-destructive evaluation and testing. Mechanical properties of structural composites.

Prerequisite: Engineering 86.270 ★.

Lectures three hours a week.

Engineering 86.450 ★

Feedback Control Systems

Introduction to the linear feedback control. Analysis and design of classical control systems. Stability and the Routh-Hurwitz criteria. Time and frequency domain performance criteria, robustness and sensitivity. Root locus, Bode and Nyquist design techniques. Control system components and industrial process automation.

Precludes additional credit for Engineering 86.352 ★.

Prerequisites: Mathematics 69.375 ★ and Engineering 94.360 ★.

Lectures three hours a week.

Engineering 86.495 ★

Professional Practice

Presentations by faculty and external lecturers on the Professional Engineers Act, professional ethics and responsibilities, practice within the discipline and its relationship with other disciplines and to society, health and safety, environmental stewardship, principles and practice of sustainable development. Communication skills are emphasized.

Precludes additional credit for Engineering 82.495 ★, 94.395 ★ or 97.395 ★.

Prerequisite: Fourth-year registration.

Lectures three hours a week.

Engineering 86.496 ★

Special Topics in Mechanical and Aerospace Engineering

At the discretion of the Faculty, a course dealing with selected advanced topics of interest to Aerospace and Mechanical Engineering students may be offered.

Prerequisite: Permission of the Department.

Aerospace Engineering

Engineering 87.302 ★

Aerospace Design and Practice

Design approach and phases. Design integration. Influence of mission and other requirements on vehicle configuration. Trade-off studies, sizing and configuration layout. Flight vehicle loads, velocity-load factor diagram. Structural design: overall philosophy, role in design process, methods.

Prerequisites: Engineering 86.201 and Third-year registration.

Lectures three hours a week, problem analysis three hours a week.

Engineering 87.311 ★

Lightweight Structures

Structural concepts; theory of elasticity; bending, torsion and shear in thin-walled beams having single or multi-cell sections; work and energy principles; deformation and force analysis of advanced structures, including stiffened thin-wall panels; finite element methods. Stability and buckling of thin-walled structures.

Prerequisite: Engineering 86.322 ★.

Lectures three hours a week; problem analysis and laboratories one hour a week.

Engineering 87.370 ★

Aerospace Materials and Manufacturing Methods

Properties, behaviour and manufacturing methods for metals, polymers and ceramics used in aerospace applications. Specialty alloys for gas turbines. Properties and manufacture of aerospace composites. Behaviour of materials in space.

Prerequisite: Engineering 86.270 ★.

Lectures three hours a week; problem analysis and laboratories one hour a week.

Engineering 87.403 ★

Aerospace Systems Design

Stress and deflection analysis; fatigue, safe life, damage tolerant design. Propulsion systems integration; landing gear; control and other subsystems. Mechanical component design. Airworthiness regulations and certification procedures. Weight and cost estimation and control. System reliability. Design studies of aircraft or spacecraft components.

Prerequisite: Engineering 86.322 ★ and 87.302 ★.

Lectures three hours a week, problem analysis three hours a week.

Engineering 87.430 ★

Acoustics and Noise Control

Behaviour of compressible fluids, sound waves and properties of sound sources; measurement of sound; human perception of sound; prediction methods based on energy considerations; sound propagation in realistic environments: outdoors, rooms, ducts; absorption and transmission loss, noise control; case studies.

Prerequisite: Mathematics 69.375 ★.

Lectures three hours a week.

Engineering 87.432 ★

Applied Aerodynamics and Heat Transfer

Differential equations of motion. Viscous and inviscid regions. Potential flow: superposition; thin airfoils; finite wings; compressibility corrections. Viscous flow: thin shear layer approximation; laminar layers; transition; turbulence modelling. Convective heat transfer: free vs forced convection; energy and energy integral equations; turbulent diffusion. Also offered at the graduate

level, with additional or different requirements, as Engineering 88.500, for which additional credit is precluded.

Prerequisite: Engineering 86.330 ★.

Lectures three hours a week.

Engineering 87.434 ★

Computational Fluid Dynamics

Differential equations of motion. Numerical integration of ordinary differential equations. Potential flows: panel methods; direct solution; vortex-lattice methods. Finite-difference formulations: explicit vs implicit methods; stability. Parabolized and full Navier-Stokes equations; conservation form. Transonic and supersonic flows: upwind differencing. Grid transformations. Computer-based assignments.

Prerequisite: Engineering 87.432 ★.

Lectures three hours a week.

Engineering 87.436 ★

Aircraft and Spacecraft Performance and Dynamics

Morphology of aircraft and spacecraft. Performance analysis of fixed wing aircraft: drag estimation, propulsion, take-off, climb and landing, endurance, payload/range, manoeuvres; operational economics. Performance analysis of rotor craft: rotor-blade motion, hovering and vertical ascent, forward flight, and autorotation. Rocket propulsion; escape velocity; orbital dynamics.

Prerequisite: Engineering 86.330 ★.

Lectures three hours a week.

Engineering 87.438 ★

Stability and Control of Aircraft

Static stability and control: equilibrium requirements; longitudinal stability requirements; neutral points; manoeuvring flight; control forces and control requirements; flight envelope diagram. Lateral stability requirements. Introduction to dynamic stability: axis systems; remarks on governing equations; phugoid and short period modes; lateral dynamic modes. Closed-loop control. Also offered at the graduate level, with additional or different requirements, as Engineering 88.511, for which additional credit is precluded.

Prerequisites: Engineering 86.330 ★ and 86.450 ★ or 86.352 ★ (taken before 1999-2000).

Lectures three hours a week.

Engineering 87.442 ★

Aerospace Propulsion

Propulsion requirements, effects of Mach Number, altitude, and application; basic propeller theory; propeller, turboshaft, turbojet, turbofan and rocket; cycle analysis and optimization for gas turbine power plant; inter-relations between thermodynamic, aerodynamic and mechanical designs; rocket propulsion; selection of aero engines.

Precludes additional credit for Engineering 88.441 ★.

Prerequisites: Engineering 86.240 ★ and 86.330 ★.

Lectures three hours a week.

Engineering 87.462 ★

Introductory Aeroelasticity

Review of structural behaviour of lifting surface elements; structural dynamics, Laplace Transforms, dynamic stability; model analysis; flutter, Theodorsin's theory; flutter of a typical section; Wing flutter, T-tail flutter, propeller whirl flutter; gust response; buffeting, limit cycle flutter.

Prerequisites: Engineering 86.304 ★, 86.330 ★ and 94.360 ★.

Lectures three hours a week.

Engineering 87.468 ★

Composite Materials

Reinforcing mechanisms in composite materials; material properties. Strength and elastic constants of unidirectional composites; failure criteria. Analysis of laminated plates; bending and eigenvalue

problems. Environmental effects and durability. Damage tolerance. Design of composite structures.

Prerequisite: Engineering 86.322 ★.

Lectures three hours a week.

Engineering 87.481 ★

Spacecraft Design

Types of spacecraft; mission requirements. Systems design considerations: configuration control during design; planning and scheduling. Environmental considerations: thermal, effect of vacuum, debris impact. Design implementation: mechanical, thermal, and electrical/electronic aspects. Spacecraft testing: vibrational, acoustic, vacuum, and thermal testing. Component testing. Simulation.

Prerequisites: Engineering 86.240 ★, and 87.302 ★ or 88.302 ★.

Lectures three hours a week.

Engineering 87.497

Aerospace Engineering Project

Participation in team projects dealing with design and development of an aerospace vehicle or system. One or more such projects will be undertaken each year. Opportunities to exercise initiative, engineering judgment, self-reliance and creativity, in a team environment similar to industry. Oral presentations and reports.

Prerequisites: Completion of or concurrent registration in Engineering 87.403 ★; and Fourth-year registration in the Aerospace program.

Mechanical Engineering

Engineering 88.302 ★

Machine Design and Practice

The design of mechanical machine elements is studied from theoretical and practical points of view. Topics covered include: design factors, fatigue, and discrete machine elements. Problem analysis emphasizes the application to practical mechanical engineering problems.

Prerequisites: Engineering 86.201 ★, 86.322 ★.

Lectures three hours a week, problem analysis three hours a week.

Engineering 88.370 ★

Principles of Manufacturing Engineering

Manufacturing processes, materials. Casting: solidification and heat flow theory, defect formation, casting design. Metal forming: elementary plasticity theory, plastic failure criteria, force and work calculations. Bulk and sheet forming. Joining: heat flow and defect formation theory, residual stresses. Machining theory and practice. Hardening: diffusion, wear resistance.

Prerequisite: Engineering 86.270 ★.

Lectures and tutorials three hours a week; problem analysis and laboratories one hour a week.

Engineering 88.403 ★

Mechanical Systems Design

Design of mechanical systems: establishing design criteria, conceptual design, design economics, value analysis, synthesis and optimization. Mechanical elements/systems: gear and flexible drive systems, fluid power systems. Problem analysis involves synthesis of mechanical systems in practice.

Prerequisite: Engineering 88.302 ★.

Lectures three hours a week, problem analysis three hours a week.

Engineering 88.406 ★

Vehicle Engineering I

The course emphasizes the engineering and design principles of road transport vehicles. Topics to be covered include: performance characteristics, handling behaviour and ride quality of road vehicles.

Prerequisites: Engineering 86.211 ★ and Third- or Fourth-year registration.

Lectures three hours a week.

Engineering 88.407 ★

Vehicle Engineering II

Engineering and design principles of off-road vehicles and air cushion technology. Topics include: mechanics of vehicle-terrain interaction - terramechanics, performance characteristics of off-road vehicles, steering of tracked vehicles, air cushion systems and their performance, applications of air cushion technology to transportation.

Prerequisites: Engineering 86.211 ★ and Third- or Fourth-year registration.

Lectures three hours a week.

Engineering 88.411 ★

Mechanics of Deformable Solids

Course extends the student's ability in design and stress analysis. Topics include: introductory continuum mechanics, theory of elasticity, stress function approach, Lamé and Mitchell problems, stress concentrations, thermoelasticity and plasticity.

Prerequisite: Engineering 86.322 ★.

Lectures three hours a week.

Engineering 88.413 ★

Fatigue and Fracture Analysis

Elastic and elasto-plastic fracture mechanics. Fatigue design methods, fatigue crack initiation and growth Paris law and strain-life methods. Fatigue testing, scatter, mean stress effects and notches. Welded and built up structures, real load histories and corrosion fatigue. Damage tolerant design and fracture control plans.

Lectures three hours a week.

Engineering 88.414 ★

Vibration Analysis

Free and forced vibrations of one and two degree-of-freedom systems. Vibration measurement and isolation. Numerical methods for multi-degree-of-freedom systems. Modal analysis techniques. Dynamic vibration absorbers. Shaft whirling. Vibration of continuous systems: bars, plates, beams and shafts. Energy methods. Holzer method.

Prerequisite: Engineering 86.304 ★.

Lectures three hours per week.

Engineering 88.435 ★

Fluid Machinery

Types of machines. Similarity: performance parameters; characteristics; cavitation. Velocity triangles. Euler equation: impulse and reaction. Radial pumps and compressors: analysis, design and operation. Axial pumps and compressors: cascade and blade-element methods; staging; off-design performance; stall and surge. Axial turbines. Current design practice. Also offered at the graduate level, with additional or different requirements, as Engineering 88.541, for which additional credit is precluded.

Prerequisite: Engineering 86.330 ★.

Lectures three hours a week.

Engineering 88.441 ★

Power Plant Analysis

Criteria of merit; selection of power plant for transportation and power generation applications; interrelation among mechanical, thermodynamic and aerodynamic design processes; jet propulsion, turbojets and turbofans; alternative proposals for vehicular power plant; combined cycle applications.

Precludes additional credit for Engineering 87.442 ★.

Prerequisite: Engineering 86.240 ★.

Lectures three hours a week.

Engineering 88.443 ★

Energy Conversion and Power Generation

Energy sources and resources. Basic elements of power generation. Hydro-electric, fossil-fuel and fissile-fuel power plants. Other methods of conversion. Future methods of conversion. Economic and environmental considerations. Power generation systems. Future power needs.

Prerequisite: Engineering 86.240 ★.

Lectures three hours a week.

Engineering 88.446 ★

Heat Transfer

Mechanisms of heat transfer: fundamentals and solutions. Steady and transient conduction: solution and numerical and electrical analog techniques. Convective heat transfer: free and forced convection for laminar and turbulent flows; heat exchangers. Heat transfer between black and grey surfaces, radiation shields, gas radiation, radiation interchange.

Prerequisite: Engineering 86.330 ★.

Lectures three hours a week.

Engineering 88.447 ★

Heating, Ventilating and Air Conditioning

Comfort. Environmental demands for residential, commercial and industrial systems. Methods of altering and controlling environment. Air distribution. Refrigeration methods, equipment and controls. Integrated year-round air-conditioning and heating systems; heat pumps. Cooling load and air-conditioning calculations. Thermal radiation control. Component matching. System analysis and design.

Prerequisites: Engineering 86.240 ★ and Third- or Fourth- year registration.

Lectures three hours a week.

Engineering 88.451 ★

State Space Modeling and Control Techniques

Review of matrices. Geometric structure and dynamics of linear systems. Controllability and observability. Pole placement design of controllers and observers. Design of regulator and servo systems. Transmission zeros. Eigenstructure assignment. Relationship to frequency or classical control techniques. Computer solutions using MATLAB. Applications.

Precludes additional credit for Engineering 94.552 ★.

Prerequisite: Engineering 86.450 or 86.352 ★ (taken before 1999-2000).

Lectures three hours a week.

Engineering 88.453 ★

An Introduction to Robotics

History of robotics and typical applications. Robotic actuators and sensors. Kinematics of manipulators, inverse kinematics, differential relationships and the Jacobian. Manipulator dynamics. Trajectory generation and path planning. Robot control and performance evaluation. Force control and compliance. Applications in manufacturing and other industries.

Prerequisites: Mathematics 69.375 ★ and Engineering 94.360 ★.

Lectures three hours a week.

Engineering 88.464 ★

Finite Element Methods

Finite element methodology with emphasis on applications to stress analysis, heat transfer and fluid flow using the simplest one- and two-dimensional elements. Direct equilibrium, variational and Galerkin formulations. Computer programs and practical applications. Higher order elements.

Prerequisites: Engineering 86.322 ★ and 86.330 ★.

Lectures three hours a week.

Engineering 88.474 ★

Computer-Integrated Manufacturing Systems (CIMS)

Overview of the topics essential to CIMS including computer graphics, geometric modelling, numerically controlled machining, and flexible manufacturing with the objective of understanding the fundamental data structures and procedures for computerization of engineering design, analysis and production. Also offered at the graduate level, with additional or different requirements, as Engineering 88.574, for which additional credit is precluded.

Prerequisite: Engineering 87.370 ★ or 88.370 ★.

Lectures three hours a week.

Engineering 88.475 ★

CAD/CAM

Computer aided design (CAD): Design process, computer graphics hardware, software standards. Wire frames, boundary representations, constructive solids geometry. Data bases. Graphics, product interchange files. Computer aided manufacturing (CAM): numerical control (NC), CNC, DNC, adaptive control. CAM programming. Management issues including acquisition, training and security. Also offered at the graduate level, with additional or different requirements, as Engineering 88.575, for which additional credit is precluded.

Prerequisite: Fourth-year registration.

Lectures three hours a week.

Engineering 88.485 ★

Measurement Systems and Data Handling

Experimental data, accuracy and uncertainty analysis. Analog systems. Sensors. Signal conditioning. Op-Amps, instrumentation amplifiers, charge amplifiers, filters. Digital techniques. Encoders, A/D D/A converters. Data acquisition using microcomputers. Hardware and software considerations. Interfacing. Applications to measurement of motion, strain, force/torque, pressure, fluid flow, temperature.

Precludes additional credit for Engineering 97.485 ★.

Prerequisites: Mathematics 69.352 ★, Engineering 94.360 ★ and 97.365 ★ or 97.251 ★.

Lectures three hours a week.

Engineering 88.497

Engineering Project

Students are required to complete a major project in engineering analysis, design, development or research. Opportunities to develop initiative, self-reliance, creative ability and engineering judgment. The results must be submitted in a comprehensive report with appropriate drawings, charts, bibliography, etc.

School for Studies in Art and Culture

Music

(Arts and Social Sciences)

911A Loeb Building
Telephone: 520-5770

Academic Administration

Director, Bryan Gillingham

Assistant Director, Bryan Gillingham

Supervisor of Undergraduate Studies, Patrick Cardy

Supervisor of Performance and Practical Studies, Deirdre Piper

Supervisor of Practica, Elaine Keillor

Teaching Staff

Professors

Patrick R.T. Cardy, B.Mus. (Western Ontario), M.M.A., D.Mus. (McGill) • **Bryan R. Gillingham**, B.A., B.Mus. (British Columbia), M.Mus. (King's College), Ph.D. (Washington) • **Alan Murray Gillmor**, B.Mus. M.A. (Michigan), Ph.D. (Toronto) • **Elaine Keillor**, B.A., M.A., Ph.D. (Toronto) • **John Shepherd**, B.A., B.Mus. (Carleton), A.R.C.M. (Royal College of Music), D. Phil. (York, U.K.)

Associate Professor

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Instructor

Jennifer Giles, A.Mus., B.Mus. (McGill), M.A. (Carleton)

Adjunct Research Professors

P. Bellomia • **David Gardner** • **H. Kallmann** (National Library of Canada) • **Lora Matthews** • **Peter Wicke** (Direktor, Forschungszentrum populäre Musik, Humboldt Universität)

Research Associates

Robert Barclay (Canadian Conservation Institute) • **Clifford Ford** (Canadian Musical Heritage Society) • **Anne-Marie Gaston** • **Carl Widstrand**

Sessional Lecturers

K. Armstrong • **M. Bussière** • **L. Canton** • **R. Frayne** • **A. Schau**

Directors

Lisette Canton, Carleton University Choir • **Rob Frayne**, Carleton University Jazz Orchestras (CUJO) • **Iain Phillips**, Early Music Ensemble • **Todd Snelgrove**, Contemporary Music Group

Instrumental and Vocal Instructors

Peggy Atherton, Viols • **Nicholas Atkinson**, Tuba • **Paul Bourdeau**, Guitar • **Jean-Guy Brault**, Saxophone • **Susanna Burton**, Voice • **Ian Clyne**, Piano • **Wayne Eagles**, Guitar • **Mark Eisenman**, Jazz Piano • **Garry Elliott**, Guitar • **Mark Ferguson**, Piano • **Rob Frayne**, Saxophone • **Barbara Gaizauskas**, Recorder • **John Geggie**, Double Bass • **Don Gress**, French Horn • **Jay Harrison**, Euphonium • **Dave Hildinger**, Piano • **Drummond Hudson**, Trombone • **Verna Jacobson**, Piano • **Don Johnson**, Percussion • **Ken Kanwisher**, Electric Bass • **Kim Kaskiw**, Voice • **Elaine Keillor**, Piano • **Lorne Kelly**, Drums • **John Kryszak**, Popular/Jazz Voice • **Manon LeComte**, Harp • **Ranee Lee**, Jazz Vocal • **Alan Marsden**, Guitar • **Christopher McCann**, Drums • **Joan Milkson**, Violin/Viola • **Veronica Milroy**, Oboe • **Gloria Jean Nagy**, Voice • **Dina Namer**, Harpsichord, Piano • **Michael Namer**, Bassoon • **Robert Oades**, Trumpet • **Kathryn Palmer**, Voice • **Iain Phillips**, Early Instruments • **Deirdre Piper**, Organ • **Catherine Rollins**, Flute • **Stephen Rollins**, Guitar • **Laurie Rosewarne**, Accordion • **Barbara Ross**, Voice • **Bill Rowat**, Trumpet • **Ann Schau**, Piano • **John Seck**, Guitar • **Joy Skrapek**, Clarinet • **Charlotte Stewart**, Voice • **Martin Walters**, Jazz Trumpet • **Wesley Warren**, Organ • **Donald Whitton**, Cello

General Information

The purpose of the programs offered by the Discipline of Music is to promote an intellectual, aesthetic and emotional understanding of music as an expression of human cultural activity. All students will be encouraged to examine the meanings and motivations of the art and to develop their speculative and critical responses to it in both historical and contemporary contexts. Stated briefly, the Discipline wishes to offer flexibility of choice and emphasis in programs that foster a basic grasp of the nature of musical processes from historical, social, practical and artistic points of view.

In addition to its undergraduate programs, the Discipline offers courses at the graduate level in the history of Canadian music in cooperation with the School of Canadian Studies.

The Discipline also sponsors a variety of performing groups including the Carleton University Choir, Early Music Ensemble, The Contemporary Music Group, and the Carleton University Jazz Orchestras (CUJO), all of which are open to Carleton students and members of the community.

Courses Requiring No Previous Music Theory or Music Performance

Although serving Music's programs, all courses offered by Music other than performance courses (which are identified in the Calendar as being open only to B.Mus. students) can be taken as options by students registered in programs elsewhere in the University. A substantial number of the courses that can be taken as options

require no previous music theory or music performance. Courses requiring no previous music theory or music performance are as follows: 30.101 ★, 30.102 ★, 30.205 ★, 30.206 ★, 30.207 ★, 30.208 ★, 30.209 ★, 30.210 ★, 30.211 ★, 30.212 ★, 30.213 ★, 30.214 ★, 30.215 ★, 30.216 ★, 30.300, 30.312 ★, 30.313 ★, 30.314 ★, 30.316 ★, 30.332 ★, 30.340 ★, 30.341 ★, 30.342 ★, 30.442, 30.433 ★, 30.498. Special topics (30.420 ★ to 30.424 ★) and specialized studies courses (30.420 ★ to 30.424 ★) may or may not be offered in any year and may or may not require previous music theory or music performance. Students are advised to consult Music each year regarding these courses.

Graduation Regulations

In order to graduate, students must fulfill all University graduation regulations (see p. 48) and all Faculty regulations (see p. 74), in addition to all Discipline regulations and requirements as set out below.

Honours in Music Program (B.Mus.)

Each prospective student should have an appreciable background in practical music-making and must consult the Discipline of Music for advice before entering the program.

Admission to the B.Mus. program is by audition. Auditions will be scheduled at various times during the academic year preceding entry to the program. Applicants who reside more than 100 km from Ottawa can audition by means of a tape with an affidavit. Prospective students can audition in any classical, folk, traditional or popular idiom. The applicant is expected to display technical competence in an instrument or voice. Full details of what is expected in the audition are available from the Music Discipline Office of the School.

The four-year B.Music program requires 20.0 credits (plus four 0.0 credit value courses in Ensembles), including a minimum of 13.0 credits in Music as follows:

1. Performance:

30.190, 30.290 and 30.390;

2. Music Theory:

30.171 ★, 30.172 ★, 30.270 ★, 30.271 ★, 30.272 ★

0.5 credit from 30.370 ★, 30.371 ★, 30.470 ★ or 30.471 ★;

3. Music History/Musicology:

30.101 ★, 30.102 ★;

1.0 credits from 30.205 ★, 30.206 ★, 30.207 ★, 30.208 ★, 30.209 ★, 30.210 ★, 30.211 ★, 30.212 ★, 30.213 ★, 30.214 ★, 30.215 ★, 30.216 ★;

1.0 credit from 30.300, 30.312 ★, 30.313 ★, 30.314 ★, 30.315 ★, 30.316 ★, 30.332 ★, 30.340 ★, 30.341 ★, 30.342 ★

4. Ensembles:

30.193 ★ and 30.293 ★

Two of 30.192 ★, 30.292 ★, 30.392 ★, 30.393 ★, 30.492 ★, 30.493 ★;

5. Choice:

1.0 credit in Music at the 200-level

1.5 credits in Music at the 300-level

1.5 credits in Music at the 400-level

Students who obtain a grade of F in any one of 30.190, 30.290, 30.390, 30.490, or 30.497 ★, or a grade of Uns in 30.192 ★, 30.193 ★, 30.292 ★, 30.293 ★, 30.392 ★, 30.393 ★, 30.492 ★, or 30.493 ★ will be removed from the B.Mus. program.

Students transferring into and continuing in the B.Mus. program with First-, Second- or Third-year standing must have achieved a GPA of 6.0 in the required Music credits and a CI of 6.00. Students beginning the final 5.0 credits towards the B.Mus degree must have achieved a GPA of 6.5 in the required Music credits and a CI of 6.00. To be eligible to graduate, B.Mus. students must have a Gradu-

ation Average of 6.5 in the required Music credits and a CI of 6.00. The Music GPA and the Music Graduation Average will be calculated only on the successfully completed graded courses counting towards the required Music credits in the program; Music credits counted as options in the program and courses graded Sat/Uns will not be included in the calculation. Courses graded Sat/Uns will also not be counted as attempts and will not be used in the calculation of the CI.

B.A. (Honours) in Music

Students with little or no background in music theory are strongly encouraged to enhance their understanding of music theory by taking some music theory courses such as 30.116 ★, 30.117 ★, 30.171 ★, 30.172 ★.

The four-year B.A.(Honours) program requires 20.0 credits, including a minimum of 10.0 credits in Music as follows:

1. 30.101 ★, 30.102 ★;

2. 1.0 credit chosen from Music 30.205 ★, 30.206 ★, 30.207 ★, 30.208 ★, 30.209 ★, 30.210 ★, 30.211 ★, 30.212 ★, 30.213 ★, 30.214 ★, 30.215 ★, 30.216 ★;

3. 1.0 credit from 30.300, 30.312 ★, 30.313 ★, 30.314 ★, 30.315 ★, 30.316 ★, 30.332 ★, 30.340 ★, 30.341 ★, 30.342 ★;

4. 2.0 additional credits in Music at the 200-level;

5. 2.0 credits in Music at the 300-level;

6. 2.0 credits in Music at the 400-level;

7. 1.0 credit in Music.

Note: Performance courses may not be taken in this program, although other music courses (including theory and composition) may be chosen as electives.

Students transferring into and continuing in the B.A. Honours program with First-, Second- or Third-year standing must have achieved a GPA of 6.0 in the required Music credits and a CI of 6.00. Students beginning the final 5.0 credits towards the B.A. Honours degree must have achieved a GPA of 6.5 in the required Music credits and a CI of 6.00. To be eligible to graduate B.A. Honours students must have achieved a GPA of 6.5 in the required Music credits and a CI of 6.00. The Music GPA and the Music Graduation Average will be calculated on only the required Music credits in the program; Music credits counted as Options in the program will not be included in the calculation.

Combined B.A. (Honours) in Music

Students with little or no background in music theory are strongly encouraged to enhance their understanding of music theory by taking some music theory courses, such as 30.116 ★, 30.117 ★, 30.171 ★, 30.172 ★.

The combined B.A. (Honours) program in Music requires 20.0 credits, including a minimum of 7.0 credits in Music as follows:

1. 30.101 ★ and 30.102 ★;

2. 2.0 credits in Music at the 200-level;

3. 2.0 credits in Music at the 300-level;

4. 1.0 credit in Music at the 400-level;

5. 1.0 additional credit in Music.

Performance courses may not be taken in this program.

Students transferring into and continuing in the B.A. Honours program with First-, Second- or Third-year standing must have achieved a GPA of 6.0 in the required Music credits and a CI of 6.00. Students beginning the final 5.0 credits towards the B.A. Combined Honours degree must have achieved a GPA of 6.5 in

the required Music credits and a CI of 6.00. To be eligible to graduate, B.A. Combined Honours students must have achieved a GPA of 6.5 in the required Music credits and a CI of 6.00. The Music GPA and the Music Graduation average will be calculated on only the required Music credits in the program; Music credits counted as Options in the program will not be included in the calculation.

B.A. Program

Students with little or no background in music theory are strongly encouraged to enhance their understanding of music theory by taking some music theory courses, such as 30.116★, 30.117★, 30.171★, 30.172★.

The B.A. program in Music requires 15.0 credits, including a minimum of 7.0 credits in Music as follows:

1. 30.101★ and 30.102★;
2. 1.0 credit from Music 30.205★, 30.206★, 30.207★, 30.208★, 30.209★, 30.210★, 30.211★, 30.212★, 30.213★, 30.214★, 30.215★, 30.216★;
3. 2.0 credits at the 200-level;
4. 2.0 credits at the 300-level;
5. 1.0 additional credit in Music.

Performance courses may not be taken in this program. Students transferring into and continuing in the B.A. (3 year) (Music) program must have achieved and must maintain a GPA of 4.0 in the required Music credits and a CI of 4.00 in order to remain in good standing in the program. The Music GPA and the Music Graduate Average will be calculated on only the required Music credits in the program; Music credits counted as Options in the program will not be included in the calculation.

Minor in Music

Students registered in programs other than Music may register for the Minor in Music through their Registrarial Services Office.

A minor in Music consists of 4.0 credits as follows:

1. 30.101★, 30.102★;
2. 1.0 credit in Music at the 200-level;
3. 1.0 credit in Music at the 300-level;
4. 1.0 additional credit in Music.

Requirement for Breadth, for students in B.A. or B.A.(Honours) degrees

Category for Breadth	Courses in this unit
The temporal dimension of human societies, analyzing times before the present era or societies other than our own	(30.)208★, 209★
The artifacts of the imagination in literature and/or other forms, or that addresses the life of the imagination and culture.	All Music courses not listed in any other category
The understanding of social, technological and/or natural processes and the ways in which that understanding is obtained in science and social science.	(30.)332★
Matters of human values, ethics and social responsibilities	

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

The majority of courses are open to non-Majors; students are advised to consult the Discipline.

Music 30.101★

A History of Western Classical Music: Medieval to the Present
Western classical music from the medieval period to the present. Major historical periods (Medieval, Renaissance, Baroque, Classical, Romantic, Modern, Postmodern) examined through representative music ranging from Gregorian chant to contemporary experimental trends.

Precludes additional credit for Music 30.100.

Lectures three hours a week.

Music 30.102★

Introduction to the History of Popular Music

History of world popular music from the nineteenth century until the present. Topics may include the growth of the music industry, the impact of technology, stardom, world music, the role of the press, copyright, censorship, and sexuality.

Precludes additional credit for Music 30.100.

Lectures two hours a week, discussion one hour a week.

Music 30.116★

Elementary Materials of Music I

Guided study in theoretical rudiments and ear training. Successful completion of this course will fulfil the prerequisite for entry into Music 30.170.

Precludes additional credit for Music 30.115.

Prerequisite: Not available to B.Mus. students or those with sufficient expertise to enroll in Music 30.170.

Seminar two hours a week.

Music 30.117★

Elementary Materials of Music II

Guided study in theoretical rudiments and ear training. Successful completion of this course will fulfill the prerequisite for entry into Music 30.170. Not available to B.Mus. students or those with sufficient expertise to enroll in Music 30.170.

Precludes additional credit for 30.115 (taken before 1999-2000).

Seminar two hours a week.

Music 30.171★

An Introduction to Theoretical Studies I

Tonal thinking, with emphasis on the development of musician-ship skills.

Precludes additional credit for Music 30.150★, 30.151★, and 30.170.

Prerequisite: Permission of the Discipline.

Lectures and seminars five hours a week.

Music 30.172★

An Introduction to Theoretical Studies II

A continuation of the materials of 30.171★.

Precludes additional credit for Music 30.150★, 30.151★ and 30.170.

Lectures and seminars five hours a week.

Music 30.190

Performance I

Individual vocal or instrumental instruction for B.Mus. students only in high-culture, traditional and popular idioms. A brief prepared recital before a jury of faculty members is required at the end of the year. Registration is restricted to students in the B.Mus. program. Students who transfer from the B.Mus. program to a B.A. program cannot transfer credit for this course.

Precludes additional credit for Music 30.190★.

Prerequisite: Audition.

Individual tuition twenty hours a year.

Music 30.192 ★

Instrumental Ensemble I

Participation in an instrumental ensemble, by arrangement with the Supervisor of Performance and Practical Studies. Registration is restricted to students in the B. Mus. program. Music 30.192 ★ (as well as all the other instrumental ensemble courses: 30.292 ★, and 30.492 ★) is a required course in the B. Mus. program with a 0.0 credit value. Graded *Sat/Uns*.

Prerequisite: First-year standing in the B. Mus. program or permission of the Discipline.

Ensemble work approximately two hours a week throughout the year and participation in concerts.

Music 30.193 ★

Choral Ensemble I

Participation in a choral ensemble, by arrangement with the Supervisor of Performance and Practical Studies. Registration is restricted to students in the B. Mus. program. Music 30.193 ★ as well as all the other choral ensemble courses (30.293 ★, 30.393 ★, 30.493 ★) is a required course in the B. Mus. program with a 0.0 credit value. Graded *Sat/Uns*.

Prerequisite: First-year standing in the B. Mus. program or permission of the Discipline.

Ensemble work approximately two hours a week throughout the year and participation in concerts.

Music 30.205 ★

Ragtime and Jazz

A survey of ragtime and jazz from their roots in pre-twentieth-century black music and white music to contemporary jazz idioms, including an examination of New Orleans jazz, and Dixieland, swing, bebop, cool jazz and free jazz.

Precludes additional credit for Music 30.225 ★.

Prerequisite: Second-year standing.

Lectures three hours a week.

Music 30.206 ★

Popular Musics before 1945

An examination of selected aspects of the development of Anglo-American popular musics from their roots in the nineteenth century until the shifts and tensions which led to the advent of rock 'n' roll and soul in the 1950s. Genres to be examined include blues, country, the sentimental ballad, and Broadway and film music.

Precludes additional credit for Music 30.223 ★, 30.226 ★ and 30.228 ★.

Prerequisite: Second-year standing.

Lectures three hours a week.

Music 30.207 ★

Popular Musics after 1945

An examination of selected aspects of the development of Anglo-American and world popular musics from the advent of rock 'n' roll and soul to the present. Genres to be examined include early rock 'n' roll, British rhythm 'n' blues, Motown, West Coast music, punk, heavy metal, new wave, disco and country.

Precludes additional credit for Music 30.227 ★, 30.228 ★, and 30.229 ★.

Prerequisite: Second-year standing.

Lectures three hours a week.

Music 30.208 ★

An Introduction to Ethnomusicology

The basic techniques in ethnomusicology are introduced and illustrated through case studies of the folk and tribal musics of Europe, Asia, Africa, Australia and Oceania, North and South America.

Precludes additional credit for Music 30.230 ★.

Prerequisite: Second-year standing.

Lectures three hours a week.

Music 30.209 ★

Music of the Asian High Cultures

A comparative and analytical study of music in Asian high cultures, including India, China, Korea, Indonesia, Japan, and the Arabic world, through an examination of the music, musical instruments and theoretical systems.

Precludes additional credit for Music 30.231 ★.

Prerequisite: Second-year standing.

Lectures three hours a week.

Music 30.210 ★

Music in the Middle Ages

A survey of music in its courtly, national and ecclesiastical contexts from 350 until 1450, including the study of secular monophony, medieval polyphony and liturgical music.

Precludes additional credit for Music 30.200 ★.

Prerequisite: Second-year standing.

Lectures three hours a week.

Music 30.211 ★

Music in the Renaissance

A survey of music from 1450 to 1650, including examination of works from the Burgundian and Flemish schools, French chanson, sacred Latin music, Italian and Elizabethan madrigal, and dance music. Transitions from the renaissance to baroque style will also be explored.

Precludes additional credit for Music 30.201 ★.

Prerequisite: Second-year standing.

Lecture three hours a week.

Music 30.212 ★

Music in the Baroque Era

A survey of the major genres and composers in the period 1650 to 1750. Genres considered will be instrumental music, oratorio, motet, cantata, sonata, concerto, and opera. Some of the composers studied will be Schütz, Lully, Couperin, Rameau, Buxtehude, the Scarlatis, Vivaldi, Bach, and Handel.

Precludes additional credit for Music 30.201 ★.

Prerequisite: Second-year standing.

Lecture three hours a week.

Music 30.213 ★

Music in the Classical Era

European music from the early eighteenth century to the beginning of Romanticism. The evolution of the Classical style in important works of composers from the 1720s to the Viennese school of Haydn, Mozart, and Beethoven.

Precludes additional credit for Music 30.202 ★.

Prerequisite: Second-year standing.

Lectures three hours a week.

Music 30.214 ★

Music in the Romantic Era

European classical music from c.1790 to c.1910. Important genres (art song, symphony, opera, etc.) as well as individual and national styles in the context of the socio-political climate of the period.

Precludes additional credit for Music 30.202 ★.

Prerequisite: Second-year standing.

Lectures three hours a week.

Music 30.215 ★

Twentieth-Century Music to World War II

A survey of European high-culture music from 1890 to circa 1945. Idioms to be examined in the socio-political climate of the period include Debussyan impressionism, Viennese expressionism, nationalism and Stravinskian neoclassicism.

Precludes additional credit for Music 30.203 ★.

Prerequisite: Second-year standing.

Lectures three hours a week.

Music 30.216 ★

Music Since World War II

A study of selected aspects of the musical avant-garde in the Western classical tradition in the socio-political climate of the post-War period. Aspects to be examined include serialism, colouristic and textural composition, music of political commitment, electronic music, musical theatre, process music and the music of chance.

Precludes additional credit for Music 30.204 ★.

Prerequisite: Second-year standing.

Lectures three hours a week.

Music 30.261 ★

Introduction to Writing Music I

An introduction to basic music writing skills (notation, instrumentation, practical arranging), focusing both on the acquisition of technical skills (which will be useful to students for careers in teaching, music productions, etc.) and on creative compositional skills.

Precludes additional credit for Music 30.260.

Prerequisite: Music 30.171 ★ and 30.172 ★ or permission of the Discipline.

Lectures and workshops three hours a week.

Music 30.262 ★

Introduction to Writing Music II

A continuation of 30.261 ★ but with more emphasis on musical creativity, incorporating workshop performances of student creations.

Precludes additional credit for Music 30.260.

Prerequisite: Music 30.261 ★ or permission of the Discipline.

Lectures and workshops three hours a week.

Music 30.265 ★

Choral Conducting

A course designed to introduce students to the special stylistic features of choral music from the Renaissance to the present as well as to a variety of practical techniques (vocal production, gesture, conducting patterns, diction, etc.). The course includes a survey of choral literature as well as practical experience in conducting techniques.

Lectures three hours a week.

Music 30.270 ★

Theoretical Studies III: Common Practice

A study of the harmonic, melodic, rhythmic and formal structures of music of the common practice period, with emphasis on the development of written musical skills.

Precludes additional credit for Music 30.250 ★.

Prerequisite: Music 30.170 or permission of the Discipline.

Lectures two hours a week throughout the year.

Music 30.271 ★

Theoretical Studies IV: Popular Music Practice

A study of the rhythmic, melodic, harmonic and formal structures of popular musics.

Prerequisite: Music 30.170 or permission of the Discipline.

Lectures two hours a week throughout the year.

Music 30.272 ★

Theoretical Studies V: Aural Training

A practical study of music as an aural phenomenon. Hearing skills and aural concentration are developed through recall, reproduction, aural analysis and transcription. Sound materials are drawn from a wide range of sources, live and recorded.

Precludes additional credit for Music 30.251 ★.

Prerequisite: Music 30.170 or permission of the Discipline.

Seminars three-and-a-half hours a week throughout the year.

Music 30.273 ★

Theoretical Studies: Practical Skills

This course is designed to give a practical study of rhythm, harmony and melody on the keyboard. The emphasis will be on vocal

and instrumental accompaniment and the development of improvisation skills in a variety of styles.

Precludes additional credit for Music 30.152 ★.

Prerequisites: Music 30.170 or equivalent and permission of the Discipline.

Seminars one and one-half hours a week throughout the year.

Music 30.290

Performance II

A continuation of Music 30.190 for B.Mus. students only. A brief prepared recital before a jury of faculty members is required at the end of the year. Registration is restricted to students in the B.Mus. program only.

Students who transfer from the B.Mus. program to a B.A. program cannot transfer credit for this course.

Prerequisite: Second-year standing, Music 30.190 or permission of the Discipline.

Individual tuition twenty hours a year.

Music 30.292 ★

Instrumental Ensemble II

Instrumental ensemble, a continuation of 30.192 ★.

Prerequisite: Second-year standing in the B.Mus. program or permission of the Discipline.

Ensemble work approximately two hours a week throughout the year and participation in concerts.

Music 30.293 ★

Choral Ensemble II

Choral ensemble, a continuation of 30.193 ★.

Prerequisite: Second-year standing in the B.Mus. program or permission of the Discipline.

Ensemble work approximately two hours a week throughout the year and participation in concerts.

Music 30.300

Approaches to the Study of Music

This course surveys the development of historical musicology, ethnomusicology, popular music studies, music theory, music analysis and music criticism as distinct sub disciplines and considers the range of theories and methods they provide for the study of music. The course considers established approaches as well as more recent developments deriving from various forms of cultural theory and feminism.

Precludes additional credit for Music 30.321 ★, 30.322 ★, 30.471 ★ and 30.472 ★.

Prerequisites: Music 30.100 and permission of the Discipline.

Seminars three hours a week.

Music 30.312 ★

Music in the United States in the Twentieth Century

A survey of contemporary American music. Topics include: Ives and the experimental tradition; Copland; Thomson; Harris and the American nationalists; the neoromantics; Gershwin and the third stream; and post-1945 developments in indeterminacy and minimalism.

Precludes additional credit for Music 30.312 (if taken before 1986-87).

Lectures three hours a week.

Music 30.313 ★

Aspects of Canadian Musical Heritage

Canadian music introduced through its roots in First Peoples, Anglo- and Franco-folk and notated musics which provided the foundation for Canada's concert music traditions of the twentieth century.

Precludes additional credit for Music 30.310.

Lectures three hours a week.

Music 30.314 ★

Popular Musics of Canada

Popular musics by Canadians including sheet music examples from

1840s on, Canada's successes in Tin Pan Alley, in Afro-Canadian styles, and various popular expressions of the twentieth century (country, rock, rap, bhangra, First Nations contemporary, etc.). Precludes additional credit for Music 30.310.
Lectures three hours a week.

Music 30.316 ★

Popular Musics of the World

Popular musics of the world, including those of Africa, Asia, Central and Eastern Europe, Latin America, the Caribbean and Oceania. Special attention to the interaction between some world popular musics and the Western record industry.
Prerequisite: Music 30.208 ★ or Music 30.209 ★.
Lectures three hours a week.

Music 30.332 ★

Music and Gender I

This course explores the role of gender in the theory and practice of music in western and non-western cultures. Attention is directed to women's participation in music to make good their absence from traditional accounts in music's history, significance and development.
Lectures three hours a week.

Music 30.340 ★

A History of Opera before 1800

A survey of the development of opera from the beginnings to about 1800. The course deals with the major monuments of Italian, French, German and English opera, by such composers as Monteverdi, Cavalli, Scarlatti, Purcell, Lully, Gluck, Rameau, Mozart and Haydn.
Lectures three hours a week.

Music 30.341 ★

A History of Opera from 1800 to 1945

A study of romantic and contemporary opera through an examination of selected works from Weber's *Der Freischütz* to Britten's *Peter Grimes*, including an investigation of national styles from Wagnerian music drama and Italian verismo to Russian realism and German expressionism.
Lectures three hours a week.

Music 30.342 ★

Film Music

This course will explore the use of music in film, from the silent era to the present day, studying the techniques, styles and theory of film music through the examination of selected films. (Also listed as Film Studies 19.342 ★.)
Lectures three hours a week, screening two hours a week.

Music 30.360

Composition II

In part a continuation of Music 30.261 ★ and 30.262 ★, but more emphasis is placed on developing the student's own creative personality.
Precludes additional credit for Music 30.360.
Prerequisite: Music 30.261 ★ and 30.262 ★ or permission of the Discipline.
Seminars two hours a week.

Music 30.363 ★

Computer Music Techniques

An introduction to the techniques of sound synthesis primarily through practical experience at the digital synthesizer and computer. This course includes the basics of machine operations, software and computer applications to composition and synthesis. Enrollment in this course is limited.
Prerequisite: Second-year standing.
Lectures three hours a week, plus individual studio time.

Music 30.364 ★

Computer Music Projects

A continuation of Music 30.363 ★. The various applications of digital equipment are examined through the realization of original projects. Students may focus on studio composition, software development or analytic research. Appropriate compositional techniques and problem solving strategies are also discussed. Enrollment in this course is limited.
Prerequisite: Music 30.363 ★ or Second-year standing.
Lectures three hours a week, plus individual studio time.

Music 30.370 ★

Theoretical Studies VI: Seminar in Theory Topics

A study of a selected topic in music theory. Topics will change yearly and may include: methods of music analysis; analysis of selected works; styles and structures of common practice or post common practice period; 16th or 18th century counterpoint; history of music theory.
Precludes additional credit for Music 30.350 ★.
Prerequisite: Music 30.270 ★ or permission of the Discipline.
Seminar three hours a week.

Music 30.371 ★

Theoretical Studies VII: Jazz Styles and Structures

Techniques of arranging and composition for small and large ensembles will be studied through the examination of selected works drawn from the jazz repertoire. Works will be selected for stylistic and theoretical analysis, for exercises in aural recognition, and for arranging purposes.
Precludes additional credit for Music 30.424 ★.
Prerequisite: Music 30.271 ★ or permission of the Discipline.
Lectures three hours a week.

Music 30.390

Performance III

A continuation of Music 30.290 for B.Mus. students only. A brief prepared recital before a jury of faculty members is required at the end of the year. Registration in this course is restricted to B.Mus. students only. Students who transfer from the B.Mus. program to a B.A. program cannot transfer credit for this course.
Prerequisite: Third-year standing, Music 30.290 or permission of the Discipline.
Individual tuition twenty hours a year.

Music 30.392 ★

Instrumental Ensemble III

Instrumental ensemble, a continuation of 30.292 ★.
Prerequisite: Third-year standing in the B.Mus. program or permission of the Discipline.
Ensemble work approximately two hours a week throughout the year and participation in concerts.

Music 30.393 ★

Choral Ensemble III

Choral ensemble, a continuation of Music 30.293 ★.
Prerequisite: Third-year standing in the B.Mus. program or permission of the Discipline.
Ensemble work approximately two hours a week throughout the year and participation in concerts.

Music 30.413 ★

Topics in Ethnomusicology

Issues of anthropological, sociological, and analytical approaches are examined in the context of detailed analyses of selected musical traditions. Also offered at the graduate level, with additional requirements, as Music 30.513, for which additional credit is precluded.
Prerequisite: Fourth-year standing.
Seminar two hours a week.

Music 30.414 ★

Musics of Canada's First Peoples

The context and significance of musical expressions for representative Nations in each of the Canadian geographical regions, Maritime, Eastern Nomadic, Eastern Sedentary, Plains, Western Subarctic, Plateau, Northwest Coast, and Arctic, are examined from the pre-Contact period to the present. Also offered at the graduate level, with additional requirements, as Music 30.512, for which additional credit is precluded.

Prerequisite: Fourth-year standing.

Seminar two hours a week.

Music 30.419

Specialized Studies

A course designed for Music Honours students who have acquired an extensive background through courses in theory, musicology or composition. The course offerings change from year to year.

Prerequisite: Permission of the Discipline.

Lectures and seminars three hours a week.

Music 30.420 ★

Special Topics

Courses focusing on one selected aspect of music, in the area of either musicology, theory or composition. The course offerings change from year to year.

Prerequisite: Permission of the Discipline.

Lectures and seminars three hours a week.

Music 30.421 ★

Special Topics

Courses focusing on one selected aspect of music, in the area of either musicology, theory or composition. The course offerings change from year to year.

Prerequisite: Permission of the Discipline.

Lectures and seminars three hours a week.

Music 30.422 ★

Special Topics

Courses focusing on one selected aspect of music, in the area of either musicology, theory or composition. The course offerings change from year to year.

Prerequisite: Permission of the Discipline.

Music 30.423 ★

Special Topics

Courses focusing on one selected aspect of music, in the area of either musicology, theory or composition. The course offerings change from year to year.

Prerequisite: Permission of the Discipline.

Lectures and seminars three hours a week.

Music 30.424 ★

Special Topics

Courses focusing on one selected aspect of music, in the area of either musicology, theory or composition. The course offerings change from year to year.

Prerequisite: Permission of the Discipline.

Lectures and seminars three hours a week.

Music 30.425 ★

Specialized Studies

Courses designed for Music Honours students who have acquired an extensive background through courses in theory, musicology or composition. The course offerings change from year to year.

Prerequisite: Permission of the Discipline.

Lectures and seminars three hours a week.

Music 30.426 ★

Specialized Studies

Courses designed for Music Honours students who have acquired an extensive background through courses in theory, musicology or composition. The course offerings change from year to year.

Prerequisite: Permission of the Discipline.

Lectures and seminars three hours a week.

Music 30.427 ★

Specialized Studies

Courses designed for Music Honours students who have acquired an extensive background through courses in theory, musicology or composition. The course offerings change from year to year.

Prerequisite: Permission of the Discipline.

Lectures and seminars three hours a week.

Music 30.428 ★

Specialized Studies

Courses designed for Music Honours students who have acquired an extensive background through courses in theory, musicology or composition. The course offerings change from year to year.

Prerequisite: Permission of the Discipline.

Lectures and seminars three hours a week.

Music 30.429

Specialized Studies

A course designed for Music Honours students who have acquired an extensive background through courses in theory, musicology or composition. The course offerings change from year to year.

Prerequisite: Permission of the Discipline.

Lectures and seminars three hours a week.

Music 30.430 ★

Notation of Medieval and Renaissance Music

An introduction to the notation of medieval and renaissance music with emphasis on the major paleographic and transcriptional problems to be encountered in early chant notation, square and Franconian notations, the innovations of the Ars Nova and mannerist phases, white notation, and various lute tablatures. Examples are selected, for detailed study and transcription, from the ninth to sixteenth centuries.

Prerequisite: Music 30.200 ★ or permission of the Discipline.

Lectures three hours a week.

Music 30.433 ★

Music and Gender II

This course explores the relationship between the social and formal organization of music and the social and formal organization of gender difference. A principal focus of the course is to understand the role of music in the social construction of gender as well as the role of gender in the determination of musical style and taste.

Precludes additional credit for Music 30.333 ★ and 30.424 ★.

Prerequisite: Music 30.332 ★ or permission of the Discipline.

Seminar three hours a week.

Music 30.442 ★

Film Music Analysis

An examination through selected films/programs of approaches to understanding music as an integral dimension of film and television. Emphasis will be placed on theories of signification in both film/television and music, and how they can be understood to relate. (Also listed as Film Studies 19.422 ★.)

Prerequisite: Music 30.324 ★ or Film Studies 19.342 ★, or permission of the Discipline.

Lecture and screening three hours a week, seminar one and one-half hours a week.

Music 30.460 ★

Composition III

A continuation of Music 30.360 ★ for students who possess a displayed aptitude for composition. The course centres around the writing of original works of substantial proportions and for a variety of media. Students are encouraged to prepare some of their music for public performance.

Precludes additional credit for Music 30.360, 30.460, and 30.496.

Prerequisite: Music 30.360 ★ or permission of the Discipline.

Seminar one hour a week.

Music 30.470 ★

Theoretical Studies VIII: Seminar in Theory Topics

A study of a selected topic in music theory. Topics will change yearly and may include: methods of music analysis; analysis of selected works; styles and structures of common practice or post common practice period music; 16th or 18th century counterpoint; history of music theory.

Prerequisite: Music 30.270 ★ or permission of the Discipline.
Seminars three hours a week.

Music 30.471 ★

Theoretical Studies IX: Jazz Styles and Structures

This course is similar to Music 30.371 ★ and may be taken in lieu of Music 30.371 ★. Students taking both courses, in any order, will be expected to demonstrate a development of their own techniques throughout their individual course of study.

Prerequisite: Music 30.271 ★ or permission of the Discipline.
Seminars three hours a week

Music 30.473 ★

Performance Practice

A seminar to examine how music in earlier periods of the Western tradition was performed, the "authentic" movement of the twentieth century, and the boundaries within which compositions of Asian high cultures and jazz and popular music standards can be realized.

Prerequisite: Permission of the Discipline.
Seminars three hours a week.

Music 30.480 ★

Practicum in Music

Practical experience in music-specific projects such as recording studios, librarianship, research, multimedia, etc. at local institutions. A maximum of one credit of practicum may be offered in fulfilment of Music requirements.

Prerequisites: Honours Music registration with Third- or Fourth-year standing and a B+ or better average in Music courses; or permission of the Discipline.

Music 30.481 ★

Practicum in Music

Practical experience in music-specific projects such as recording studios, librarianship, research, multimedia, etc. at local institutions. A maximum of one credit of practicum may be offered in fulfilment of Music requirements.

Prerequisites: Honours Music registration with Third- or Fourth-year standing and a B+ or better average in Music courses; or permission of the Discipline.

Music 30.490

Performance IV

A continuation of Music 30.390 for B.Mus. students only. A brief prepared recital before a jury of faculty members is required at the end of the year. Students who transfer from the B.Mus. program to a B.A. program cannot transfer credit for this course. This course may not be taken in addition to or concurrently with Music 30.497.

Precludes additional credit for Music 30.490 ★.

Prerequisite: Fourth-year standing, Music 30.390 or permission of the Discipline.

Individual tuition twenty hours a year.

Music 30.492 ★

Instrumental Ensemble IV

Instrumental ensemble, a continuation of 30.392 ★.

Prerequisite: Fourth-year standing in the B.Mus program or permission of the Discipline.

Ensemble work approximately two hours a week throughout the year and participation in concerts.

Music 30.493 ★

Choral Ensemble IV

Choral ensemble, a continuation of 30.393 ★.

Prerequisite: Fourth-year standing in the B.Mus. program.

Ensemble work approximately two hours a week throughout the year and participation in concerts.

Music 30.496

Honours Portfolio in Composition

A project involving the composition and written analysis (of approximately 20 pages) of an original work of substantial length, prepared in consultation with the Discipline and an assigned adviser. This course is recommended for B.Mus. students wishing to undertake intensive study in composition. This course will be double-weighted in the calculation of the Music GPA.

Precludes additional credit for Music 30.460.

Prerequisite: Permission of the Discipline.

Music 30.497

Graduating Recital

Recommended for B.Mus students intending to continue performance studies. The course requires preparation of a public performance of at least one hour duration arranged in consultation with Director of Performance Studies and teacher. This course will be double-weighted in the calculation of the Music GPA average. This course may not be taken in addition to or concurrently with Music 30.490 ★.

Prerequisites: Fourth-year standing and permission of the Discipline.

Individual tuition twenty hours a year.

Music 30.498

Honours Essay in Musicology

An Honours research essay of approximately 50 pages in length on a topic chosen in consultation with the Discipline and an assigned supervisor. This course will be double-weighted in the calculation of the Music GPA. This course is subject to the Faculty regulations on the Honours Paper or Research Essay (see p. 67).

Prerequisite: Permission of the Discipline.

Graduate Courses

The following graduate courses can be found in the *Graduate Studies and Research Calendar*.

Music 50.501, 50.505, 50.510, 50.511, 50.512, 50.513, 50.515

Graduate Studies in Music

Philosophy (Arts and Social Sciences)

2123 Dunton Tower
Telephone: 520-2110

Academic Administration

Chair, Jay Drydyk

Supervisor of Graduate Studies, Marvin Glass

Supervisor of Undergraduate Studies, Diane E. Dubrule

Teaching Staff

Professor Emeritus

James C.S. Wernham, M.A. (Aberdeen, Cambridge) S.T.M. (Union)

Professors

J. Andrew Brook, B.A., M.A. (Alberta), D.Phil. (Oxford) • **Peter Emberley**, B.A. (British Columbia), M.A. (Toronto), Ph.D. (London School of Economics) • **Geraldine Finn**, B.A. (Keele), M.A. (McMaster), Ph.D. (Ottawa) • **Waller R. Newell**, B.A., M.A. (Toronto), M.Phil, Ph.D. (Yale)

Associate Professors

Wendy Donner, B.A. (Manitoba), M.A., Ph.D., (Toronto) • **Jay Drydyk**, B.A. (Chicago), M.A. (Notre Dame), Ph.D. (Toronto) • **Béla I Egyed**, B.A. (Sir George Williams), M.A., Ph.D. (McGill) • **Marvin Glass**, M.A. (Manitoba) • **Randal R.A. Marlin**, A.B. (Princeton), M.A. (McGill), Ph.D. (Toronto) • **Robert J.H. Stainton**, B.A. (York), Ph.D. (Massachusetts Institute of Technology)

Assistant Professors

Diane E. Dubrule, A.B. (Cornell), B.C.S. (Carleton), M.A., Ph.D. (Toronto) • **Rebecca Kukla**, B.A. (Toronto), Ph.D. (Pittsburgh) • **Richard N. Manning**, B.A., J.D., Ph.D. (Northwestern)

Adjunct Research Professors

Louis Charland • **Christine Koggel** • **Will Kymlicka** • **Hilmar Lorentz** • **Joseph McDonald**

Adjunct Professors

Stanley G. Clarke • **Andrew Jeffrey** • **John W. Leyden** • **Stephen Talmage** • **James M. Thompson** • **Julian Wolfe**

Graduation Regulations

In order to graduate, students must fulfill all University graduation Regulations (see p. 48), all Faculty regulations including those for First Year Seminars and Breadth requirements (see p. 63), in addition to all Major regulations and requirements as set out below.

Courses Open to First-Year Students

The following courses are open to First-year students: Philosophy 32.110, 32.150, 32.160 (full credits); 32.101 ★, 32.102 ★, 32.151 ★, 32.184 ★, 32.201 ★, 32.203 ★ (half-credits). Please note that not all of these courses are offered each year. No more than 2.0 credits at the 100-level may be used to satisfy requirements for graduation in any degree program.

B.A. (Honours) Program

The Honours program may be entered at the beginning of the First year or by transfer from the B.A. program. Students intending to enter the Honours program are advised to include 1.0 credit in Philosophy at the 100-level in the First-year program. In certain circumstances this requirement will be waived for students entering the Honours or Combined Honours program after the First year, who may be permitted to substitute an upper-year credit in Philosophy.

The Honours program consists of 20.0 credits with at least 10.0 credits in Philosophy. A minimum of 9.0 credits in Philosophy must be beyond the 100-level. The program for the Second and subsequent years is planned in consultation with the Department. Courses must be chosen according to the following requirements:

1. 3.0 credits in the history of philosophy: 32.206 ★, 32.209 ★, 32.304 ★, and 32.306 ★ and 1.0 additional credit;
2. 2.0 credits in ethics, society and aesthetics;
3. 2.0 credits in language, mind and knowledge;
4. 2.0 credits at the 400-level or above in Philosophy.

Courses falling within the foregoing groups are:

History of Philosophy: 32.206 ★, 32.207 ★, 32.208 ★, 32.209 ★, 32.222 ★, 32.223 ★, 32.301 ★, 32.304 ★, 32.306 ★, 32.307 ★, 32.308 ★, 32.314 ★, 32.315 ★;

Ethics, Society and Aesthetics: 32.211 ★, 32.212 ★, 32.214 ★, 32.221 ★, 32.236 ★, 32.237 ★, 32.284 ★, 32.286 ★, 32.287 ★, 32.311 ★, 32.312 ★, 32.313 ★, 32.330, 32.340, 32.341 ★, 32.342 ★, 32.348 ★;

Language, Mind and Knowledge: 32.201 ★, 32.231 ★, 32.245 ★, 32.251 ★, 32.252 ★, 32.254 ★, 32.331 ★, 32.332 ★, 32.336 ★, 32.351 ★, 32.354 ★, 32.356 ★.

Combined Honours Programs

In Combined Honours programs the Philosophy requirements are 7.0 credits, to include 6.0 credits beyond the 100-level of which 1.0 credit must be at the 400-level or above and must be taken at Carleton. Details of the specific requirements for these programs must be obtained from the Department. Combined Honours programs are available in Philosophy with the following subjects: Art History, Biology, Economics, English, French, History, Human Rights, Journalism, Law, Linguistics and Applied Language Studies, Mathematics, Political Science, Psychology, Religion, Sociology-Anthropology and Women's Studies. Special arrangements may be made for other combinations. Students proposing other

combinations must consult the Supervisor of Undergraduate Studies.

Specialization in Philosophy, Ethics and Public Affairs

A student may take up to 12.0 credits in Philosophy and up to 3.0 additional credits in Political Science towards a B.A. (Honours) Specialization in Philosophy, Ethics and Public Affairs. Students intending to take this Specialization are strongly encouraged to include either a First Year Seminar in Philosophy or a 1.0 Philosophy credit at the 100-level (especially 32.150) in their First year program. The requirements are:

1. 32.211 ★, 32.212 ★, 32.313 ★, 32.330.
2. at least 2.0 credits chosen from: 32.150, 32.184 ★, 32.213 ★, 32.214 ★, 32.221 ★, 32.222 ★, 32.236 ★, 32.237 ★, 32.284 ★, 32.290, 32.311 ★, 32.312 ★, 32.348 ★.
3. Political Science 47.230 and 2.0 Political Science credits chosen from: 47.319 ★, 47.333, 47.334, 47.335 ★, 47.431 ★, 47.432 ★, 47.434, 47.436 ★, 47.437 ★.
4. 1.5 credits in History of Philosophy (see list on p. 374);
5. 1.0 credit in Language, Mind and Knowledge (see list on p. 374);
6. 2.0 credits at the 400-level or above in Philosophy.

B.A. Program

Students in the B.A. program in Philosophy will present a minimum of 6.0 credits in Philosophy including 5.0 credits beyond the 100-level.

These credits must be chosen to include 1.0 credit in History of Philosophy. History of Philosophy courses are: 32.206 ★, 32.207 ★, 32.208 ★, 32.209 ★, 32.222 ★, 32.223 ★, 32.301 ★, 32.304 ★, 32.306 ★, 32.307 ★, 32.308 ★, 32.309 ★, 32.314 ★, 32.315 ★.

All B.A. program students will arrange their programs in consultation with the Department.

Minor in Philosophy

A minor in Philosophy will consist of 4.0 credits in Philosophy, to include at least 3.0 credits beyond the 100-level.

The above requirements may be met by choosing one of the following patterns of courses:

Philosophy, Ethics and Public Affairs: 4.0 credits chosen from courses in the philosophy, ethics and public affairs group, to include:

1. Philosophy 32.150 or Political Science 47.230;
2. 32.211 ★ and 32.212 ★;
3. 32.330;
4. 1.0 credit chosen from: 32.184 ★, 32.213 ★, 32.214 ★, 32.221 ★, 32.222 ★, 32.236 ★, 32.237 ★, 32.284 ★, 32.311 ★, 32.312 ★, 32.313 ★, 32.348 ★.

History of Philosophy: 4.0 credits in Philosophy to include:

1. 32.110 or 32.160;
2. 32.206 ★ and 32.209 ★;
3. 32.304 ★ and 32.306 ★;
4. 1.0 credit chosen from: 32.207 ★, 32.208 ★, 32.211 ★, 32.221 ★, 32.222 ★, 32.223 ★, 32.301 ★, 32.307 ★, 32.308 ★, 32.314 ★, 32.315 ★.

Philosophy of Mind: 4.0 credits in Philosophy to include:

1. 32.151 ★ and 32.201 ★;
2. 32.231 ★ and 32.254 ★;

3. 32.251 ★ and 32.252 ★;

4. 1.0 credit chosen from: 32.209 ★, 32.231 ★, 32.304 ★, 32.306 ★, 32.314 ★, 32.315 ★, 32.331 ★, 32.332 ★, 32.351 ★.

Philosophy of Language: 4.0 credits to include:

1. 32.151 ★;
2. 32.201 ★, 32.232 ★, 32.254 ★, 32.354 ★ and 32.356 ★;
3. 1.0 credits chosen from: 32.308 ★, 32.314 ★, 32.315 ★, or 32.336 ★.

Philosophy of Journalism and Mass Communication: 4.0 credits in Philosophy to include:

1. 1.0 credit chosen from 100-level courses in Philosophy;
2. 32.290;
3. 32.254 ★ and 32.203 ★;
4. A further 1.0 credit chosen from: 32.184 ★, 32.211 ★, 32.212 ★, 32.221 ★, 32.231 ★, 32.236 ★, 32.237 ★, 32.284 ★, 32.330, 32.332 ★, or 32.348 ★.

"Mention: français"

Students in the B.A. (Honours) or B.A. program in Philosophy may qualify for the notation "Mention: français" by fulfilling the requirements outlined. Those wishing to pursue this path should consult with the Department's Undergraduate Supervisor, whose approval is required for all courses under the "Mention: français."

Philosophy courses presented in fulfillment of the "Mention: français" requirements can double as courses to satisfy Philosophy B.A. or B.A. (Honours) requirements.

B.A. (Honours) or Combined B.A. (Honours)

To graduate with the notation "Mention: français", students must include in their program the following:

1. 1.0 credit in French language chosen in consultation with the Department of French for the purpose of perfecting the student's French language skills.
2. 1.0 credit from the following list of courses taught in French at Carleton and concerned with the study of the heritage and culture of French Canada: French (20.270, 20.372 ★, 20.373 ★).
3. 1.0 credit from among 32.391 ★, 32.391 ★, 32.393 ★, 32.396 ★, 32.397 ★, 32.398 ★ (Independent Study) with philosophical works read in French and papers submitted in French to be assessed by two members of the Department of Philosophy knowledgeable in the language, or 1.0 credit in Philosophy at the 300-level taught in French at another university and acceptable to the Department of Philosophy.
4. 1.0 credit from among special projects (Philosophy 32.490, 32.491 ★, 32.492 ★, 32.493 ★, 32.494 ★, 32.496 ★ Tutorial) in French, supervised by a member of the Department of Philosophy, or earned in a Philosophy seminar or seminars at the 400-level taught in French at another university and acceptable to the Department of Philosophy. Students must, in addition, satisfy the Honours requirement of 2.0 Carleton credits at the 400-or 500-level in Philosophy (1.0 for Combined Honours).
5. Combined Honours students must meet the "Mention: français" requirements of both Honours disciplines.

B.A. Program

To graduate with the notation "Mention: français", students must include in the program the following:

1. same as 1 above

2. same as 2 above
3. same as 3 above

Graduate Program

The Department of Philosophy offers studies leading to the degree of Master of Arts. For information see the Graduate Studies and Research Calendar, or consult the departmental Graduate Studies Supervisor.

Requirement for Breadth, for students in B.A. or B.A.(Honours) degrees

Category for Breadth	Courses in this unit
The temporal dimension of human societies, analyzing times before the present era or societies other than our own	(32.)160, 206 ★, 207 ★, 208 ★, 209 ★, 222 ★, 301 ★, 304 ★, 306 ★, 307 ★, 01.130
The artifacts of the imagination in literature and/or other forms, or that addresses the life of the imagination and culture.	(32.)223 ★, 286 ★, 287 ★, 340, 342 ★
The understanding of social, technological and/or natural processes and the ways in which that understanding is obtained in science and social science.	(32.)102 ★, 110, 151 ★, 201 ★, 203 ★, 231 ★, 232 ★, 237 ★, 245 ★, 251 ★, 252 ★, 254 ★, 256 ★, 308 ★, 314 ★, 315 ★, 331 ★, 332 ★, 336 ★, 354 ★, 356 ★, 01.128
Matters of human values, ethics and social responsibilities	(32.)101 ★, 150, 184 ★, 211 ★, 212 ★, 213 ★, 214 ★, 221 ★, 236 ★, 261 ★, 284 ★, 290, 311 ★, 312 ★, 313 ★, 330, 348 ★, 01.129

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

First-Year Seminar in Philosophy 01.128

Looking at Philosophy

An examination of the following: What is logical thinking? Does God exist? Are values relative? Do we have responsibilities? What is a just society? Do we have free will? What is the mind? What is the nature of reality? Limited enrolment.

Precludes additional credit for Philosophy 32.110.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar in Philosophy 01.129

Contemporary Moral, Social, and Religious Issues

Philosophical problems associated with such topical issues as feminism; atheism vs. Theism; the meaning of life; moral relativism vs. moral objectivism; egoistic vs. Non-egoistic ethics; euthanasia and capital punishment; legal paternalism; freedom of the will. Limited enrolment.

Precludes additional credit for Philosophy 32.150.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar in Philosophy 01.130

History of Philosophy

The major figures and developments in philosophy from the early

Greeks to the present. A primarily descriptive and comparative approach, through critical reasoning is included for comprehending philosophic development. Provides a background from which to understand the philosophical aspects of other disciplines. Limited enrolment.

Precludes additional credit for Philosophy 32.160.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

Philosophy 32.101 ★

Ethics and Philosophy of Religion

An examination of arguments for and against the existence of God; the nature of religious language and the meaning and justification of moral judgments.

Lectures three hours a week.

Philosophy 32.102 ★

Knowledge and Reality

Topics include the nature and definition of knowledge, perception and the nature of the external world, the status of necessary truths and of scientific knowledge.

Lectures three hours a week.

Philosophy 32.110

Looking at Philosophy

Introduction to philosophy: the nature of logical thinking; the existence of God; the objectivity of values; the meaning of life; free will; determinism and responsibility; the relation between the mind and body; immortality and the possibility of knowledge.

This course is not intended for Majors (B.A. or B.A.(Honours)) in Philosophy.

Precludes additional credit for First-Year Seminar 01.128.

Lectures three hours a week.

Philosophy 32.150

Contemporary Moral, Social and Religious Issues

Moral theories, atheism or theism, feminism, and free will. Moral arguments concerning abortion, affirmative action, racism, human rights, children's rights, world hunger, capital punishment, euthanasia, censorship, pornography, legal paternalism, animal rights and environmental protection.

Precludes additional credit for First-Year Seminar 01.129.

Lectures three hours a week.

Philosophy 32.151 ★

Mind and Truth

An introduction to philosophy of mind and philosophy's contribution to cognitive science. Topics include: how mind is related to body; what free choice is and whether it is possible; what truth is and how philosophical truths differ from truths of psychology.

Precludes additional credit for Philosophy 32.106 ★.

Lectures three hours a week.

Philosophy 32.160

History of Philosophy

Major figures and developments in philosophy from the early Greeks to the present. Descriptive and comparative approach, providing an understanding of the place of philosophers in the history of thought. Appreciation of critical reasoning is included for comprehending philosophical developments.

Precludes additional credit for First-Year Seminar 01.130.

Lectures three hours a week.

Philosophy 32.184 ★

Introduction to Environmental Ethics

An introduction to major questions in environmental ethics, including: How should human beings view their relationship to the rest of nature? Is responsible stewardship of the environment compatible with current technology? Do distinct forms of life, for example endangered species, have value? Do animals, other life-forms, ecosystems and/or the biosphere have rights? Is the right

to liberty and property compatible with protecting the environment and meeting our obligations to future generations?

Lectures three hours a week.

Philosophy 32.201 ★

Introduction to Symbolic Logic

An introduction to the techniques and philosophical implications of formal logic with emphasis on the following issues: translation of expressions into symbolic form, testing for logical correctness, the formulation and application of rules of inference, and the relation between logic and language.

Open to First-year students.

Lectures three hours a week.

Philosophy 32.203 ★

Informal Reasoning

Assessment of reasoning and the development of cogent patterns of thinking. Reference to formal logic is minimal. Practice in criticizing examples of reasoning and in formulating one's own reasons correctly and clearly.

Open to First-year students.

Precludes additional credit for Philosophy 32.120.

Lectures three hours a week.

Philosophy 32.206 ★

Greek Philosophy: Plato and Aristotle

A study, both historical and critical, of some central issues in the philosophy of Plato and of Aristotle. (This course is also listed as Classical Civilization 13.206 ★)

Precludes additional credit for Philosophy 32.205.

Prerequisite: At least 0.5 credit in Philosophy or Second-year standing.

Lectures three hours a week.

Philosophy 32.207 ★

Hellenistic and Early Medieval Philosophy

The evolution of western philosophy from the fourth through the twelfth century: theories of human nature, knowledge and reality are traced from the Hellenistic philosophers through the early medieval syntheses of reason with Christianity. Several thinkers (e.g. Plotinus, Augustine and Anselm) are studied in depth. (Also listed as Classical Civilization 13.207 ★)

Precludes additional credit for Philosophy 32.225.

Prerequisite: Philosophy 32.206 ★ or permission of the Department.

Lectures three hours a week.

Philosophy 32.208 ★

Philosophy in the Late Middle Ages, Renaissance and Reformation

The evolution of western philosophy from the scholasticism of the high middle ages to the humanism of the Renaissance and the scepticism and fideism of the Reformation and Counter-Reformation period. Several thinkers such as Aquinas, Montaigne and Francis Bacon are studied in depth.

Precludes additional credit for Philosophy 32.225.

Prerequisite: Philosophy 32.206 ★ or permission of the Department.

Lectures three hours a week.

Philosophy 32.209 ★

Early Modern Philosophy: the Rationalists

European philosophy of the seventeenth and early eighteenth century. Representative works of writers such as Descartes, Spinoza and Leibniz.

Precludes additional credit for Philosophy 32.215.

Prerequisite: Philosophy 32.206 ★, 32.207 ★ or 32.208 ★; or permission of the Department.

Lectures three hours a week.

Philosophy 32.211 ★

History of Ethics

An introduction to ethical theories through a study of some of the major figures in moral philosophy, such as Aristotle, Hume, Kant and Mill.

Prerequisite: At least 0.5 credit in Philosophy or Second-year standing.

Lectures three hours a week.

Philosophy 32.212 ★

Contemporary Ethical Theory

Critical study of the main types of modern ethical theories, their views on the nature of morality and the justification of moral claims. Topics utilitarianism, libertarianism, communitarianism, egoism, neo-Kantianism, virtue ethics, social contract ethics, feminist ethics, and moral rights.

Prerequisite: Philosophy 32.211 ★ or permission of the Department.

Lectures three hours a week.

Philosophy 32.213 ★

Philosophy of Human Rights

A philosophical introduction to human rights: their sources, concepts, justifications, consequences, and challenges to them. Evolution of selected human rights as (a) demands made in political struggles; (b) declarations supported by moral or political principles and arguments; (c) codes ratified and implemented by governments and international organizations.

Prerequisite: A course in Philosophy or Second-year standing.

Lectures three hours a week.

Philosophy 32.214 ★

Computer Ethics

Ethical issues arising from computing. The influence of computers on work, social power, privacy, computer crime, intellectual property rights. Ethical problems posed by research areas such as artificial intelligence, artificial life, expert systems, neural nets, virtual reality and robotics.

Prerequisite: A course in Philosophy or Second-year standing.

Lectures three hours a week.

Philosophy 32.221 ★

Introduction to Marxist Philosophy

The evolution of Marx's social and political views in the setting of 18th and 19th century anarchism, liberalism and conservatism. Themes of humanism, freedom, rights, the state, democracy, alienation, and inequality, primarily as they develop into the theory of historical materialism.

Precludes additional credit for Philosophy 32.220.

Prerequisite: At least 0.5 credit in Philosophy or permission of the Department.

Lectures three hours a week.

Philosophy 32.222 ★

Topics in Marxist Philosophy

The dialectical materialism of Marx, Engels, and Lenin is compared with traditional materialist, idealist, and mechanist philosophy. Marxist views on justice, equality, ethical objectivity, and human well-being. Contemporary issues such as the former Soviet Union and racism and censorship.

Precludes additional credit for Philosophy 32.220.

Prerequisite: Philosophy 32.221 ★ or at least 0.5 credit in the history of philosophy at the 200-level or above.

Lectures three hours a week.

Philosophy 32.223 ★

Existentialism and Phenomenology

A study of the views of such writers as Kierkegaard, Husserl, Merleau-Ponty, Heidegger and Sartre.

Precludes additional credit for Philosophy 32.270.

Prerequisite: At least 0.5 credit in the history of philosophy at the

Philosophy

200-level or above or permission of the Department.
Lectures three hours a week.

Philosophy 32.231 ★

Introduction to the Philosophy of Science

The scientific view of the world, scientific revolutions and the growth of knowledge and objectivity. Specific attention to fundamental concepts such as observations, explanation, causation and induction. Precludes additional credit for Philosophy 32.200.

Prerequisite: A course in Philosophy or Second-year standing.
Lectures three hours a week.

Philosophy 32.236 ★

Philosophy and Feminism

A study of philosophical issues arising from feminism. The course includes discussions of the relations between feminism, reason and ideological commitment, as well as critical evaluation of contemporary views on selected topics (e.g. abortion, pornography and censorship, affirmative action, and beauty).

Prerequisite: At least 0.5 credit in Philosophy or Second-year standing.
Lectures two and one half hours a week.

Philosophy 32.237 ★

Topics in Feminist Philosophy

An examination of issues such as science and gender, feminist epistemology, feminism and post modernism, and feminist ethics. In connection with these issues, practical applications are given consideration.

Prerequisite: Philosophy 32.236 ★ or permission of the Department.

Lectures two and one half hours a week.

Philosophy 32.245 ★

Philosophy of the Paranormal

Examination of claims, concepts, theories and methods in parapsychology. Their scientific character and the relation of paranormal phenomena to philosophical issues such as survival of death, human nature, time, space, causality and perception.

Prerequisite: At least 0.5 credit in Philosophy or permission of the Department.

Lectures three hours a week.

Philosophy 32.251 ★

Personal Identity and the Self

Personal identity and the relation of mind to body. Different meanings of 'personal identity' in philosophy and psychology. Leading contemporary views of the mind/body problem and the problem of our knowledge of other minds, with special emphasis on problems with introspection.

Prerequisite: At least 0.5 credit in Philosophy or permission of the Department.

Lectures three hours a week.

Philosophy 32.252 ★

Philosophy of Mind

Contemporary work on major philosophical issues concerning human cognition and the role of philosophy in cognitive science. Topics include: the mind as an intentional system and as a representational system; mental realism; consciousness; artificial intelligence; the concept of mental illness.

Prerequisite: Philosophy 32.106 ★, 32.151 ★ or 32.251 ★.

Lectures three hours a week.

Philosophy 32.254 ★

Language and Communication

Some of the central topics in the study of language and communication as pursued by linguists and philosophers. The nature of meaning; the connections between language, communication and cognition; language as a social activity. (Also listed as Mass Communication 27.254 ★ and Linguistics and Applied Language Studies 29.254 ★)

Precludes additional credit for Mass Communication 27.280, Linguistics 29.280 and Philosophy 32.280.

Prerequisite: Second-year standing.
Lectures three hours a week.

Philosophy 32.261 ★

Philosophy of Religion

A philosophical examination of some characteristic concepts of religion, such as faith, hope, worship, revelation, miracle, God. (Also listed as Religion 34.361.)

Prerequisite: A course in Philosophy or Second-year standing.
Lectures three hours a week.

Philosophy 32.284 ★

Environments, Technology and Values

An advanced treatment of some ethical issues concerning technology and the built and natural environment, including: sustainable development and the idea of progress, women and the environment, the value of biological diversity, the relation of human beings to the rest of the natural world, whether non-human beings have intrinsic value or rights, triage and distributive justice, obligations to future generations, and the conflict between liberty and equality.

Prerequisite: Philosophy 32.184 ★ or permission of the Department.
Lectures three hours a week.

Philosophy 32.286 ★

Art and Ideas: From Ancient Greece to the Twentieth Century

A survey of theories that have shaped the Western approach to art and art criticism, including Plato, Aquinas, Kant, Hegel and Nietzsche. (Also listed as Art History 11.286 ★.)

Lectures three hours a week.

Philosophy 32.287 ★

Art and Ideas: The Twentieth Century

A survey of theories that have shaped the Western approach to art and art criticism including psychological, sociological, phenomenological, semiotic and aesthetic approaches and including such thinkers as Freud, Arnheim, Marx, Heidegger, Barthes and Bell. (Also listed as Art History 11.287 ★.)

Lectures three hours a week.

Philosophy 32.290

Truth and Propaganda

Ancient and modern techniques of persuasion from analytical, ethical and jurisprudential perspectives. Objectivity and bias, advertising and public relations ethics, the viability of democracy in the light of pressures on and within the modern mass media. (Also listed as Mass Communication 27.290.)

Prerequisite: At least 0.5 credit in Philosophy or Second-year standing.
Lectures three hours a week.

Philosophy 32.301 ★

Early Greek Philosophy

A study of the presocratic Greek philosophers and of the Sophists and Socrates. (Also listed as Classical Civilization 13.301 ★).

Precludes additional credit for Philosophy 32.205.

Prerequisite: Philosophy 32.206 ★ or permission of the Department.

Lectures three hours a week.

Philosophy 32.304 ★

Early Modern Philosophy: the Empiricists

British philosophy of the late seventeenth and eighteenth century. Representative works of writers such as Locke, Berkeley and Hume. Precludes additional credit for Philosophy 32.215.

Prerequisite: At least 0.5 credit in the history of philosophy at the 200-level or above, or permission of the Department.

Lectures three hours a week.

Philosophy 32.306 ★

German Idealism

The development of German idealism from Kant to Hegel.

Precludes additional credit for Philosophy 32.305.

Prerequisite: Third-year standing or permission of the Department.

Lectures three hours a week.

Philosophy 32.307 ★

Reactions to German Idealism

A comparative study of reactions to German Idealism through examination of authors such as Schopenhauer and Nietzsche.

Precludes additional credit for Philosophy 32.305.

Prerequisite: At least 0.5 credit in the history of philosophy at the 200-level or above or permission of the Department.

Lectures and seminar three hours a week.

Philosophy 32.308 ★

Hermeneutics, Critical Theory and Deconstruction

A study of the views of such writers as Gadamer, Habermas, Foucault and Derrida.

Precludes additional credit for Philosophy 32.270.

Prerequisite: At least 0.5 credit in the history of philosophy at the 200-level or above or permission of the Department.

Lectures and seminar three hours a week.

Philosophy 32.311 ★

Philosophy of Law: The Nature of Law

This course examines the concept of law, and of those concepts that are commonly associated with it, viz. rules, obligations, authority, coercion, and force. (Also listed as Law 51.311 ★.)

Prerequisite: At least 0.5 credit in Philosophy or permission of the Department.

Lectures three hours a week.

Philosophy 32.312 ★

Philosophy of Law: The Logic of Law

This course examines legal reasoning and analyzes concepts of particular significance to the law. These include justice, rights and duties, liability, punishment, ownership and possession. (Also listed as Law 51.312 ★.)

Prerequisite: Philosophy 32.311 ★ or permission of the Department.

Lectures three hours a week.

Philosophy 32.313 ★

Moral Communication and Knowledge

Moral discourse and language use, focusing on how moral claims may be justified and whether moral knowledge is possible. Topics may include: theories of moral communication and justification; objectivity; realism and relativism; the role of community and culture; Eurocentrism; morality and gender.

Prerequisite: Philosophy 32.211 ★ or 32.212 ★ or permission of the Department

Lectures three hours a week.

Philosophy 32.314 ★

The Roots of Analytic Philosophy

In the context of the work of such writers as Frege and Bradley, adiscussion of early philosophical works of Russell, Moore and Wittgenstein. In addition some early representatives of positivism and pragmatism will be examined.

Precludes additional credit for Philosophy 32.380.

Prerequisite: At least 2.0 credits in the history of philosophy at the 200-level or above or permission of the Department.

Lectures and seminar three hours a week.

Philosophy 32.315 ★

Analytic Philosophy

Works of representative writers since 1945, including Quine, Wittgenstein and more recent figures.

Precludes additional credit for Philosophy 32.380.

Prerequisite: At least 2.0 credits in the history of philosophy at the

200-level or above or permission of the Department.

Lecture and seminar three hours a week.

Philosophy 32.330

Social and Political Philosophy

A critical examination of major perspectives in social and political philosophy, such as classical and contemporary liberalism, theories of solidarity and general will, feminism, contractarianism, Marxism, libertarianism, and communitarianism. The course will explore the bearing of these views on topics such as the state, political power and authority, democracy, majority rule, rights, human rights, justice, equality, freedom, the public and the private, and international relations.

Prerequisite: At least 0.5 credit in Philosophy or permission of the Department.

Lectures two and one half hours a week.

Philosophy 32.331 ★

Issues in the Philosophy of Science

A study of the main currents of post-positivist philosophy of science. Philosophical problems arising from concepts of truth, meaning, testability, theory-ladenness, progress, induction, objectivity, rationality, explanation and paradigms.

Prerequisite: Philosophy 32.231 ★ or permission of the Department.

Lectures three hours a week.

Philosophy 32.332 ★

Issues in the Philosophy of Social Science

Theoretical and practical issues arising in the study of social phenomena, including the uniqueness of the social sciences, the features they share with the natural sciences, and criteria for their success. Positivism, structuralism, and critical theory will be discussed.

Prerequisite: A course in Philosophy or Second-year standing.

Lectures three hours a week.

Philosophy 32.336 ★

Symbolic Logic

A review of the basic techniques of propositional and predicate logic. Natural deduction and consistency trees. Soundness and completeness. Alternative semantics. Extensions to basic logic: identity, modal logic with possible world semantics, three valued systems, deontic logic.

Precludes additional credit for Philosophy 32.335.

Prerequisite: Philosophy 32.201 ★ or permission of the Department.

Lectures three hours a week.

Philosophy 32.340

Aesthetics

Analysis of problems in the description, interpretation and evaluation of works of art, including music, literature and the visual arts, together with the study of types of aesthetic theory.

Precludes additional credit for Philosophy 32.240.

Prerequisite: At least 0.5 credit in Philosophy or Second-year standing.

Seminar two hours a week.

Philosophy 32.341 ★

Aesthetics

The first half of Philosophy 32.340, Aesthetics. (For Architecture students only.)

Precludes additional credit for Philosophy 32.241 ★.

Prerequisite: Permission of the Department. Only for students who will take Philosophy 32.342 ★ in a later year.

Seminar two hours a week.

Philosophy 32.342 ★

Aesthetics

The second half of Philosophy 32.340, Aesthetics.

Precludes additional credit for Philosophy 32.242 ★.

Prerequisite: At least 0.5 credit in Philosophy or Second-year standing.

Seminar two hours a week.

Philosophy

Philosophy 32.348 ★

Bioethics

Philosophical topics such as the nature and implications of personhood, privacy, and rights in the context of medical practice and health care.

Prerequisite: Philosophy 32.211 ★ or 32.212 ★; or permission of the Department.

Lectures three hours a week.

Philosophy 32.351 ★

Philosophy of Computer Science and Artificial Intelligence

Theoretical issues connected with computer science. How computers can help answer philosophical questions and philosophical issues that arise from computing. Issues surrounding machine cognition such as theoretical limits to computing, symbolic vs. connectionist models, and whether computers can think.

Prerequisite: 1.0 credit in Philosophy or Second-year standing in Computer Science.

Seminar two hours a week.

Philosophy 32.354 ★

Pragmatics

The theoretical study of language use, as pursued by linguists and philosophers. Conversational implicature, deixis; the semantics-pragmatics boundary; speaker's reference; speech acts. (Also listed as Mass Communication 27.354 ★ and Linguistics and Applied Language Studies 29.354 ★.)

Precludes additional credit for Mass Communication 27.280, Linguistics and Applied Language Studies 29.280 and Philosophy 32.280.

Prerequisite: At least 0.5 credits in Philosophy or Linguistics and Applied Language Studies or Second-year standing.

Lectures three hours a week.

Philosophy 32.356 ★

Semantics

The study of meaning as a part of the study of communication. Organization of the semantic structure of language, and the relation of this structure to the lexicon. (Also listed as Linguistics and Applied Language Studies 29.356 ★.)

Prerequisite: At least 0.5 credit in Philosophy or Linguistics; or permission of the department.

Lecture three hours a week.

Philosophy 32.391 ★,

Independent Study

Essays and/or examinations based on a list of readings provided by the instructor.

Prerequisite: Normally restricted to students with at least 3.0 credits in Philosophy and with high standing in Philosophy courses and permission of the Department.

Philosophy 32.392 ★,

Independent Study

Essays and/or examinations based on a list of readings provided by the instructor.

Prerequisite: Normally restricted to students with at least 3.0 credits in Philosophy and with high standing in Philosophy courses and permission of the Department.

Philosophy 32.393 ★,

Independent Study

Essays and/or examinations based on a list of readings provided by the instructor.

Prerequisite: Normally restricted to students with at least 3.0 credits in Philosophy and with high standing in Philosophy courses and permission of the Department.

Philosophy 32.396 ★

Independent Study

Essays and/or examinations based on a bibliography constructed

by the student in consultation with the instructor.

Prerequisite: Normally restricted to students with at least 3.0 credits in Philosophy and with high standing in Philosophy courses and permission of the Department.

Philosophy 32.397 ★

Independent Study

Essays and/or examinations based on a bibliography constructed by the student in consultation with the instructor.

Prerequisite: Normally restricted to students with at least 3.0 credits in Philosophy and with high standing in Philosophy courses and permission of the Department.

Philosophy 32.398 ★

Independent Study

Essays and/or examinations based on a bibliography constructed by the student in consultation with the instructor.

Prerequisite: Normally restricted to students with at least 3.0 credits in Philosophy and with high standing in Philosophy courses and permission of the Department.

Philosophy 32.403 ★

Seminar in Philosophy Before the Modern Period

Detailed study of selected philosophers or issues in philosophy before the modern period.

Prerequisite: Eligibility for Fourth-year standing in a Philosophy Honours program or permission of the Department.

Seminar two hours a week.

Philosophy 32.404 ★

Seminar in Philosophy Before the Modern Period

Detailed study of selected philosophers or issues in philosophy before the modern period.

Prerequisite: Eligibility for Fourth-year standing in a Philosophy Honours program or permission of the Department.

Seminar two hours a week.

Philosophy 32.405 ★

Seminar in Modern Philosophy

Detailed study of selected philosophers or issues in modern philosophy.

Prerequisite: Eligibility for Fourth-year standing in a Philosophy Honours program or permission of the Department.

Seminar two hours a week.

Philosophy 32.406 ★

Seminar in Modern Philosophy

Detailed study of selected philosophers or issues in modern philosophy. Also offered at the graduate level, with additional or different requirements, as Philosophy 32.540, for which additional credit is precluded.

Prerequisite: Eligibility for Fourth-year standing in a Philosophy Honours program or permission of the Department.

Seminar two hours a week.

Philosophy 32.407 ★

Seminar in Contemporary Philosophy

Detailed study of selected philosophers or issues in contemporary philosophy.

Prerequisite: Eligibility for Fourth-year standing in a Philosophy Honours program or permission of the Department.

Seminar two hours a week.

Philosophy 32.408 ★

Seminar in Contemporary Philosophy

Detailed study of selected philosophers or issues in contemporary philosophy.

Prerequisite: Eligibility for Fourth-year standing in a Philosophy Honours program or permission of the Department.

Seminar two hours a week.

Philosophy 32.413 ★

Seminar in Philosophy of Language or Mind

Detailed study of selected issues or the work of selected philosophers in philosophy of language or mind. Also offered at the graduate level, with additional or different requirements, as Philosophy 32.520, for which additional credit is precluded.

Prerequisite: Eligibility for Fourth-year standing in a Philosophy Honours program or permission of the Department.

Seminar two hours a week.

Philosophy 32.414 ★

Seminar in Philosophy of Language or Mind

Detailed study of selected issues or the work of selected philosophers in philosophy of language or mind. Also offered at the graduate level, with additional or different requirements, as Philosophy 32.520, for which additional credit is precluded.

Prerequisite: Eligibility for Fourth-year standing in a Philosophy Honours program or permission of the Department.

Seminar two hours a week.

Philosophy 32.415 ★

Seminar in Moral or Political Philosophy

Detailed study of selected issues or the work of selected philosophers in moral or political philosophy. Also offered at the graduate level, with additional or different requirements, as Philosophy 32.530, for which additional credit is precluded.

Prerequisite: Eligibility for Fourth-year standing in a Philosophy Honours program or permission of the Department.

Seminar two hours a week.

Philosophy 32.416 ★

Seminar in Moral or Political Philosophy

Detailed study of selected issues or the work of selected philosophers in moral or political philosophy. Also offered at the graduate level, with additional or different requirements, as Philosophy 32.530, for which additional credit is precluded.

Prerequisite: Eligibility for Fourth-year standing in a Philosophy Honours program or permission of the Department.

Seminar two hours a week.

Philosophy 32.421 ★

Special Topic in Epistemology

Detailed study of a special topic in epistemology.

Prerequisite: Fourth-year standing in a Philosophy Honours program or permission of the Department.

Seminar two hours a week.

Philosophy 32.422 ★

Special Topic in Epistemology

Detailed study of a special topic in epistemology.

Prerequisite: Eligibility for Fourth-year standing in a Philosophy Honours program or permission of the Department.

Seminar two hours a week.

Philosophy 32.423 ★

Special Topic in Feminist Philosophy

Detailed study of a special topic in feminist philosophy.

Prerequisite: Eligibility for Fourth-year standing in a Philosophy Honours program or permission of the Department.

Seminar two hours a week.

Philosophy 32.424 ★

Special Topic in Feminist Philosophy

Detailed study of a special topic in feminist philosophy.

Prerequisite: Eligibility for Fourth-year standing in a Philosophy Honours program or permission of the Department.

Seminar two hours a week.

Philosophy 32.431 ★

Special Topic in Logic

Detailed study of a special topic in Logic.

Prerequisite: Eligibility for Fourth-year standing in a Philosophy Honours program or permission of the Department.

Seminar two hours a week.

Philosophy 32.432 ★

Special Topic in Logic

Detailed study of a special topic in Logic.

Prerequisite: Eligibility for Fourth-year standing in a Philosophy Honours program or permission of the Department.

Seminar two hours a week.

Philosophy 32.433 ★

Special Topic in Philosophical Logic

Prerequisite: Eligibility for Fourth-year standing in a Philosophy Honours program or permission of the Department.

Seminar two hours a week.

Philosophy 32.434 ★

Special Topic in Philosophical Logic

Detailed study of a special topic in Philosophical Logic.

Prerequisite: Eligibility for Fourth-year standing in a Philosophy Honours program or permission of the Department.

Seminar two hours a week.

Philosophy 32.443 ★

Special Topic in Applied Ethics

Detailed study of a special topic in applied ethics.

Prerequisite: Eligibility for Fourth-year standing in a Philosophy Honours program or permission of the Department.

Seminar two hours a week.

Philosophy 32.444 ★

Special Topic in Applied Ethics

Detailed study of a special topic in applied ethics.

Prerequisite: Eligibility for Fourth-year standing in a Philosophy Honours program or permission of the Department.

Seminar two hours a week.

Philosophy 32.447 ★

Special Topic in Philosophy of Law

Detailed study of a special topic in philosophy of law.

(Also listed as Law 51.413 ★)

Prerequisite: Eligibility for Fourth-year standing in a Law or Philosophy Honours program or permission of either Department.

Seminar two hours a week.

Philosophy 32.448 ★

Special Topic in Philosophy of Law

Detailed study of a special topic in philosophy of law.

(Also listed as Law 51.414 ★)

Prerequisite: Eligibility for Fourth-year standing in a Law or Philosophy Honours program or permission of either Department.

Seminar two hours a week.

Philosophy 32.453 ★

Special Topic in Philosophy of Computing

Detailed study of a special topic in philosophy of computing.

Prerequisite: Eligibility for Fourth-year standing in Philosophy Honours program or permission of the Department.

Seminar two hours a week.

Philosophy 32.454 ★

Special Topic in Philosophy of Computing

Detailed study of a special topic in philosophy of computing.

Prerequisite: Eligibility for Fourth-year standing in Philosophy Honours program or permission of the Department.

Seminar two hours a week.

Philosophy

Philosophy 32.456 ★

Special Topic in Philosophy of Science

Detailed study of a special topic in philosophy of science.

Prerequisite: Eligibility for Fourth-year standing in Philosophy Honours program or permission of the Department.

Seminar two hours a week.

Philosophy 32.457 ★

Special Topic in Philosophy of Science

Detailed study of a special topic in philosophy of science.

Prerequisite: Eligibility for Fourth-year standing in Philosophy Honours program or permission of the Department.

Seminar two hours a week.

Philosophy 32.458 ★

Special Topic in Philosophy of Social Science

Detailed study of a special topic in philosophy of science.

Prerequisite: Eligibility for Fourth-year standing in Philosophy Honours program or permission of the Department.

Seminar two hours a week.

Philosophy 32.459 ★

Special Topic in Philosophy of Social Science

Detailed study of a special topic in philosophy of science.

Prerequisite: Eligibility for Fourth-year standing in Philosophy Honours program or permission of the Department.

Seminar two hours a week.

Philosophy 32.466 ★

Special Topic in Continental Philosophy

Prerequisite: Eligibility for Fourth-year standing in Philosophy Honours program or permission of the Department.

Seminar two hours a week.

Philosophy 32.467 ★

Special Topic in Continental Philosophy

Prerequisite: Eligibility for Fourth-year standing in Philosophy Honours program or permission of the Department.

Seminar two hours a week.

Philosophy 32.490

Tutorial

Prerequisite: Permission of the Department.

Philosophy 32.491 ★

Tutorial

Prerequisite: Permission of the Department. Note: Students who wish to enroll in a tutorial course must consult the Undergraduate Supervisor, before registration.

Philosophy 32.492 ★

Tutorial

Prerequisite: Permission of the Department. Note: Students who wish to enroll in a tutorial course must consult the Undergraduate Supervisor, before registration.

Philosophy 32.493 ★

Tutorial

Prerequisite: Permission of the Department. Note: Students who wish to enroll in a tutorial course must consult the Undergraduate Supervisor, before registration.

Philosophy 32.494 ★

Tutorial

Prerequisite: Permission of the Department. Note: Students who wish to enroll in a tutorial course must consult the Undergraduate Supervisor, before registration.

Philosophy 32.496 ★

Tutorial

Prerequisite: Permission of the Department. Note: Students who wish to enroll in a tutorial course must consult the Undergraduate Supervisor, before registration.

Physics (Science)

2240 Herzberg Building
Telephone: 520-3515
Fax: 520-2569

Academic Administration

Chair, J.C. Armitage

Associate Chair of Undergraduate Studies, P.C. Johns

Associate Chair of Graduate Studies (Director, Ottawa-Carleton Institute for Physics), D. Karlen

Teaching Staff

Professors

J.C. Armitage, B.Sc. (London), Ph.D. (Manchester) • **R.K. Carnegie**, B.Sc. (Queen's), M.A. (Toronto), Ph.D. (Princeton) • **Leslie A. Copley**, B.Sc. (Carleton), M.Sc. (McMaster), Ph.D. (Toronto) • **Kenneth W. Edwards**, B.S.E. (Michigan), Ph.D. (Princeton) • **Stephen Godfrey**, B.A.Sc. (Toronto), M.Sc. (Weizmann Institute), Ph.D. (Toronto) • **P.J.S. Watson**, B.Sc. (Edinburgh), Ph.D. (Durham)

Associate Professors

Boguslaw J. Jarosz, M.Sc., Ph.D. (Warsaw) • **Paul C. Johns**, B.A.Sc., M.Sc., Ph.D. (Toronto) • **Patricia Ann Kalyniak**, B.Sc. (Calgary), M.Sc., Ph.D. (British Columbia) • **D.A. Karlen**, B.Sc. (Alberta), Ph.D. (Stanford) • **Lazer Resnick**, B.Sc. (McGill), Ph.D. (Cornell) • **Giles E. Santyr**, B.Sc. (Queen's), Ph.D. (Toronto)

Distinguished Research Professor

M.K. Sundaresan, M.Sc. (Delhi), Ph.D. (Cornell)

Honourary Research Professors

P.G. Estabrooks, M.Sc., Ph.D. (Wisconsin) • **R.J. Hemingway**, Ph.D. (Oxford)

Research Associates

B. Kamal • P. Krieger • J. Wallace • J. White

Adjunct Research Professors

I. Cameron, Ottawa Regional Cancer Centre • **R.L. Clarke** • **J. Cygler**, Ottawa Regional Cancer Centre • **M. Dixit**, Centre for Research in Particle Physics • **L.H. Gerig**, Ottawa Regional Cancer Centre • **C. Greenstock**, A.E.C.L. • **C.K. Hargrove**, Centre for Research in Particle Physics • **M. Losty**, Centre for Research in Particle Physics • **B. McKee**, Ottawa Civic Hospital • **H.J.A.F. Mes**, Centre for Research in Particle Physics • **C. Ng**, Ottawa Regional Cancer Centre • **A. Noble**, C.R.P.P. • **G. Oakham**, Centre for Research in Particle Physics • **G.P. Raaphorst**, Ottawa Regional Cancer Centre • **D.W.O. Rogers**, National Research Council • **C. Ross**, National Research Council • **W.D. Sinclair**, Centre for Research in Particle Physics

Sessional Lecturers

L. Campbell • **R.S. Dick** • **I. Ivanovic**

General Information

The department offers three different first year combinations. Those students planning to take further courses in physics should enrol in 75.101 ★ and 75.102 ★ which emphasize modern physical concepts. Together with Mathematics 69.104 ★ and 69.114 ★ (or 69.107 ★ and 69.117 ★), they are the normal prerequisite for entry into second year physics courses. Those students who are interested in the engineering or scientific applications of physics should take 75.103 ★ and 75.104 ★ as their program allows. In some Engineering programs, 91.111 ★ is used in place of 75.103 ★. Other students, and especially those in the Life Sciences, should take 75.107 ★ and 75.108 ★. the content of the first course in each of these three combinations is similar, allowing some change of direction if desired - depending on the grades obtained.

Graduation Regulations

In order to graduate, students must fulfill all University graduation Regulations (see p. 48) and all Faculty regulations (see p. 109), in addition to all departmental regulations and normal requirements as set out below.

B.Sc. Honours Program in Applied Physics

Students who complete this program will have a choice of a science career applying physics in the industrial sector or further studies in graduate school. The Co-operative option, described below, offers students the possibility to mix academic study with work experience at one of the local high tech companies, government laboratories, or hospitals.

Entrance Criteria

Refer to the Faculty of Science regulations for entry into Honours programs. Students from Ontario high schools must have OAC Physics and OAC Calculus. Although not a requirement, an OAC in Algebra and Geometry is recommended.

Students seeking admission to Honours Applied Physics who have already completed Physics 75.107 ★ and 75.108 ★ will be permitted to count them in place of 75.101 ★ and 75.102 ★ provided that they have a GPA of 7.0 or better over both courses.

Graduation Regulations

In order to graduate, students must fulfill all University graduation regulations (see p. 48) and all Faculty regulations (see p. 109), in addition to all Departmental regulations and requirements as set out below.

Program Requirements

The program consists of 20.0 credits as follows:

1. 2.0 acceptable arts or social science credits;
2. 1.0 free elective credit;
3. 17.0 more credits chosen with the approval of the Department.

First Year

Physics 75.101 ★ and 75.102 ★;
 Mathematics 69.104 ★, 69.105 ★, and 69.114 ★;
 Computer Science 95.105 ★;
 one of Biology 61.103 ★ and 61.104 ★, Chemistry 65.100, or
 Geology 67.100;
 and 1.0 acceptable arts or social science credit.

Second Year

Physics 75.222 ★ and 75.264 ★;
 Mathematics 69.204 ★ and 69.375 ★;
 Engineering 91.266 ★, 97.251 ★ and 97.257 ★;
 either Computer Science 95.106 ★, and 95.202 ★ or 95.204 ★, or
 Engineering
 94.202 ★ and 94.204 ★;
 0.5 Free Elective credit.

Third Year

Physics 75.307 ★, 75.366 ★, 75.371 ★, 75.382 ★, 75.387 ★, and
 75.449 ★;
 Mathematics 69.352 ★;
 Engineering 97.315 ★, 97.398 ★, and 97.399 ★.

Fourth Year

Physics 75.408 ★ and 75.477 ★;
 one of Physics 75.497 ★ plus 0.5 Free Elective, 75.498 ★ plus 0.5
 Free Elective, or 75.499;
 1.0 additional Physics credits at the 400-level;
 an additional 0.5 credit either in Physics at the 400-level or Computer
 Science 95.305 ★, or Electronics 97.359 ★;
 1.0 acceptable arts or social science credit;
 0.5 Free Elective.

Combined Honours B.Sc., Chemistry and Physics

This program combines elements of Honours Chemistry and
 Honours Applied Physics. Students in this program may apply to
 the Co-operative Education Option, described below.

Entrance Criteria

Refer to the Faculty of Science regulations for entry into Honours
 programs (p. 109). Students from Ontario high schools must have
 OAC Physics, OAC Calculus, and OAC Chemistry.

Entrance after First Year and continuation at the end of First Year
 in the program requires: Honours standing and a grade of C+ or
 better in each of Physics 75.101 ★, 75.102 ★, and Chemistry 65.100.

Course Requirements

First Year

Physics 75.101 ★, 75.102 ★;
 Chemistry 65.100;
 Mathematics 69.104 ★, 69.105 ★, 69.114 ★;
 Computer Science 95.107 ★;
 1.0 arts or social science credit.

Second Year

Physics 75.222 ★, 75.264 ★;
 Chemistry 65.211 ★, 65.212 ★;
 Mathematics 69.204 ★, 69.375 ★;
 Engineering 91.266 ★;
 0.5 approved credit in Chemistry, Physics, Mathematics and Statistics,
 Computer Science, or Engineering;
 1.0 arts or social science credit.

Third Year

Physics 75.307 ★, 75.366 ★, 75.371 ★;
 Chemistry 65.223 ★, 65.224 ★, 65.312 ★, 65.353 ★, 65.354 ★;
 Mathematics 69.352 ★;
 Electronics 97.315 ★;

Fourth Year

Physics 75.477 ★;
 1.0 credit in Physics at the 400-level;
 Chemistry 65.315 ★, 65.412 ★;
 0.5 credit in Chemistry at the 400-level;
 1.0 credit free elective.

Double Honours B.Sc. Mathematics and Physics

This program consists of 21.5 credits, of which 16.5 or 17.0 credits
 are in Mathematics, Physics or Engineering Physics. Entrance after
 First year and continuation in the program at the end of First year
 requires: successful completion of First year with a GPA of 9.0 or
 better over the courses Mathematics 69.102 and 69.112 (or their
 equivalents), and a GPA of 9.0 or better over the courses Physics
 75.101 ★ and 75.102 ★ (or their equivalents); or permission of the
 School of Mathematics and Statistics and the Department of Phys-
 ics. Students entering the program directly from High School are
 required to present an average of 75% in OAC Physics, Calculus
 and Algebra and Geometry.

Note: The Co-op program is not normally available with this
 program.

Course Requirements

First Year

Physics 75.101 ★, 75.102 ★;
 Mathematics 69.102, 69.112;
 Biology 61.103 ★ and 61.104 ★, or Chemistry 65.100, or Geology
 67.100 or 67.105;
 Computer Science 95.105 ★ or 95.107 ★;
 0.5 arts or social science credit.

Second Year

Physics 75.222 ★, 75.264 ★, 75.382 ★;
 Mathematics 70.200, 70.210, 70.244 ★, 70.265 ★, 69.375 ★;
 0.5 credit approved Computer Science elective;

Third Year

Physics 75.307 ★, 75.366 ★, 75.371 ★, 75.449 ★;
 Mathematics 70.301 ★, 70.302 ★, 70.307 ★, 70.316 ★;
 Engineering 97.315 ★, 97.399 ★;
 0.5 arts or social science credit.

Fourth Year

Physics 75.477 ★, 75.478 ★;
 1.0 credit in Physics at the 400-level or higher;
 1.0 credit in Math at the 400-level or higher;
 Either: 70.494 ★ or 70.495 ★ or 75.497 ★ or 75.498 ★, plus 0.5
 credit free elective, or 75.499;
 1.0 arts or social science credit;
 0.5 credit free elective.

The Co-operative Education Option

General information on the Co-operative Education Option can
 be found on p. 39.

Co-operative education formally integrates the student's academic
 experience with work experience in industry and government. Work
 opportunities, which are available on a competitive basis, are coor-
 dinated to complement the student's course work and interests.
 Practical work experience provides insights and opportunities for
 development which cannot be learned in regular course work, and
 which help prepare an individual for a career in Physics.

Operation of the Co-operative Option

The Co-operative education option is administered by the Co-op Office.

Admission Requirements

To be eligible for entry, a student must:

1. be registered as a full-time student in one of the Physics Honours programs.
2. have an Honours GPA of 8.0 or better and an overall GPA of 6.5 or better.
3. be eligible to work in Canada.

Meeting the above requirements will only establish eligibility to enter the program. Enrolment in the Co-operative stream is limited and depends on the prevailing job market.

The Work/Study Sequence

The standard work term duration is four months; however, students may choose to work two terms in sequence adding up to eight months. The first work period (which is normally eight months in duration) will normally begin after completing the second year of the program of academic study as specified in the calendar under the heading of Honours program in Applied Physics. Students will return to the campus for the Winter term of academic year three and will then begin the second work period over the following summer. They can then take the Fall term courses of their third academic year (out of sequence) followed by the final work period. Students will return in the Fall to complete the fourth academic year, totaling five years in the program. The only split year in the program is academic year three. Students will be required to complete a minimum of four work terms.

If no suitable job placements can be made, the student will revert to the regular Applied Physics program.

Continuance in the Program

During work terms, students must register in one of the five Work Term Courses: 75.394★, 75.395★, 75.396★, 75.495★, or 75.496★ to be graded "Satisfactory" or "Unsatisfactory". To continue in the program students must successfully complete their work terms, one of the requirements of which is to hand in a Work Term Report judged to be "Satisfactory". The report requirements and evaluation criteria are described in the Physics Co-op Student Handbook, which also lists all the circumstances in which a student may be required to withdraw from the program. Students must maintain an Honours GPA of 8.0 or better and an overall GPA of 6.5 or better.

Graduation Requirements

All work terms should normally be completed prior to starting the last academic term. In addition to satisfying the requirements of the Co-operative program as described above, a student must have completed the 20 credits specified for the Applied Physics program and four Work Term courses in the sequence mentioned above. Variations in the sequence may be requested due to academic or work situations in the upper years but these arrangements must have the prior approval of the Co-operative Program Committee.

Graduates successfully completing the above requirements, will receive a Co-operative degree designation in addition to the Honours designation.

Graduate Program

The Department of Physics offers studies leading to the degrees of Master of Science and Doctor of Philosophy. There is a one-year industry-oriented M.Sc. program in Physics in Modern Technology

and there are research-oriented M.Sc. and Ph.D. programs in medical physics and elementary particle physics. The requirements and general regulations are given in the Faculty of Graduate Studies and Research Calendar.

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Physics 75.101★

Introductory Physics I

This calculus-based course covers mechanics, gravitation, oscillations, and thermodynamics. The laboratory is an essential and autonomous part of the course. This is a specialist course for students intending to take further courses in Physics.

Precludes additional credit for Physics 75.103★, 75.105 and 75.107★. Prerequisite: OACs in Physics and Calculus (or equivalents). Mathematics 69.104★ or 69.107★ or 69.102 (may be taken concurrently); or permission of the Department. Although not a requirement, an OAC in Algebra and Geometry is recommended.

Lectures three hours a week, tutorial one hour a week, laboratory three hours a week.

Physics 75.102★

Introductory Physics II

An introduction to relativity, electricity, magnetism, wave motion and quantum mechanics. The laboratory is an essential and autonomous part of the course. This is a specialist course for students intending to take further courses in physics.

Precludes additional credit for Physics 75.104★, 75.105 and 75.108★. Prerequisites: Physics 75.101★, Mathematics 69.104★ or 69.107★ or 69.102 (may be taken concurrently); or permission of the Department.

Lectures three hours a week, tutorial one hour a week, laboratory three hours a week.

Physics 75.103★

Physics with Engineering Applications: Mechanics

This calculus-based course covers mechanics, gravitation, oscillations, and thermodynamics. The laboratory is an essential and autonomous part of the course.

Precludes additional credit for Physics 75.101★, 75.105 and 75.107★. Prerequisites: OACs in Physics and Calculus (or equivalents); Mathematics 69.104★ or 69.107★ or 69.102 (may be taken concurrently); or permission of the Department. Although not a requirement, an OAC in Algebra and Geometry is recommended;

Lectures three hours a week, tutorial one hour a week, laboratory three hours a week.

Physics 75.104★

Introductory Physics of Electromagnetism with Engineering Applications

This calculus-based course introduces electricity, magnetism, oscillations, waves and optics. The laboratory is an essential and autonomous part of the course.

Precludes additional credit for Physics 75.102★, 75.105 and 75.108★. Prerequisites: Mathematics 69.104★ or 69.107★, Engineering 91.111★ or Physics 75.101★ or 75.103★, or permission of the Department.

Lectures three hours a week, tutorial one hour a week, laboratory three hours a week.

Physics 75.107★

Elementary University Physics I

Mechanics, properties of matter, thermodynamics. Applications chosen in part from the life sciences. For students who do not intend to take additional courses in Physics or who lack the prerequisites for Physics 75.101★.

Precludes additional credit for Physics 75.101 ★, 75.103 ★ and 75.105
Prerequisites: Mathematics 69.007 ★ (may be taken concurrently).
Lectures three hours a week, laboratory three hours a week.

Physics 75.108 ★

Elementary University Physics II

Electricity and magnetism, DC and AC circuits, wave motion and light. Elements of modern physics. Applications chosen in part from the life sciences.

Precludes additional credit for Physics 75.102 ★, 75.104 ★ and 75.105.
Prerequisites: Physics 75.101 ★, 75.103 ★ or 75.107 ★; Mathematics 69.107 ★ (may be taken concurrently).

Lectures three hours a week, laboratory three hours a week.

Physics 75.190

Introduction to Astronomy

Description of the known stellar, galactic and extra-galactic systems. Modern ideas concerning the structure, origin and evolution of the universe, pulsars and supernovae. Space-age astronomy and studies of the possible existence of extraterrestrial life. A 14-inch telescope is available for student use.

Precludes additional credit for Physics 75.223 ★.

Lectures two and one-half hours a week.

Note: Science students may only take this as a Free Elective.

Physics 75.211 ★

Mechanics and Properties of Matter

Equations of motion for a single particle. Harmonic oscillation. Noninertial reference frames. Orbits in a central force field. Motion of systems of particles and of rigid bodies. Introduction to special relativity. Laboratory experiments in classical mechanics and properties of matter.

Prerequisites: Physics 75.101 ★ and 75.102 ★, or 75.103 ★ and 75.104 ★, alternatively 75.107 ★ and 75.108 ★ with an overall average of B- or better; Mathematics 69.107 ★ and 69.117 ★, or Mathematics 69.102 and 69.112.

Lectures three hours a week, laboratory three hours a week, tutorials (optional) once a week.

Physics 75.222 ★

Wave Motion and Optics

Physical optics based on electromagnetic theory, oscillator model for dispersion, absorption, scattering, Huygen's principle, reflection and transmission as coherent scattering. Interference, coherence length, diffraction, polarization, double refraction. Geometrical optics.

Prerequisites: Physics 75.101 ★, 75.102 ★, or 75.103 ★ and 75.104 ★, alternatively 75.107 ★ and 75.108 ★ with an overall grade of B- or better; Mathematics 69.107 ★ and 69.117 ★ or Mathematics 69.102 and 69.112.

Lectures three hours a week, laboratory three hours a week.

Physics 75.223 ★

Astronomy

The observational basis of astronomy. The history of astronomy, properties of light, solar system observations and stellar astronomy. Precludes additional credit for Physics 75.190 and 75.220.

Prerequisites: Physics 75.101 ★ and 75.102 ★ or 75.105 (with a grade of B- or better); or permission of the Department.

Lectures three hours a week.

Physics 75.224 ★

Astrophysics and Cosmology

A discussion of stellar models, in particular stellar evolution and the end states of stars such as neutron stars and black holes. Galaxies and quasars; cosmology.

Precludes additional credit for Physics 75.190 and 75.220.

Prerequisite: Physics 75.223 ★ or permission of the Department.

Lectures three hours a week.

Physics 75.235 ★

Electricity and Magnetism

Electrostatics, field intensities in various charge configurations, Gauss' law, electrostatic energy. Dielectric materials, dipoles, molecular polarizability. Steady currents, properties of electrical conductors. Magnetic effects of currents and motion of charges in electric and magnetic fields. Time varying currents, electromagnetic induction. Magnetic materials and magnetic measurements.

Prerequisites: Physics 75.101 ★, 75.102 ★, or 75.103 ★ and 75.104 ★, alternatively 75.107 ★ and 75.108 ★ with an overall grade of B- or better;

Lectures three hours a week, laboratory three hours a week.

Physics 75.236 ★

Physics of Electrical and Electronic Measurements I

D.C. and A.C. circuit theory. Resonant circuits. Basic measuring devices, the oscilloscope; impedances, bandwidth, noise; vacuum tubes, transistors, useful approximations for circuit design; feedback, amplifiers, oscillators; operational circuits; digital circuits. Lectures emphasize the physical basis of instrument design. Laboratory emphasizes modern digital instrumentation.

Prerequisites: Physics 75.101 ★, 75.102 ★ or 75.103 ★ and 75.104 ★, alternatively 75.107 ★ and 75.108 ★ with an overall grade of B- or better;

Lectures three hours a week, laboratory three hours a week.

Physics 75.262 ★

Modern Physics I

Provides a transition from classical to modern physics. Special relativity. Kinetic theory. Thermal radiation. Rutherford scattering, atomic models. Photoelectric effect, Compton scattering. Bohr theory of the hydrogen atom. Atomic energy states, optical spectra, lasers. X-rays. Radioactivity. Quantum mechanics.

Precludes additional credit for Physics 75.361 ★.

Prerequisites: Physics 75.101 ★, 75.102 ★, Mathematics 69.102, 69.112, (or Mathematics 69.107 ★ and 69.117 ★), Physics 75.211 ★, 75.235 ★. (Physics 75.105 is also acceptable in place of 75.101 ★ and 75.102 ★ provided a minimum grade of B- is obtained.)

Lectures three hours a week.

Physics 75.264 ★

Modern Physics I

The course is designed to provide a logical transition from classical to modern physics. Special relativity. Kinetic theory. Thermal radiation. Rutherford scattering, atomic models. Photoelectric effect, Compton scattering. Bohr theory of the hydrogen atom. Atomic energy states, optical spectra, lasers, X-rays. Radioactivity. Quantum Mechanics.

Precludes additional credit for Physics 75.211 ★, 75.235 ★ and 75.262 ★.

Prerequisites: Physics 75.222 ★, or permission of the Department.

Lectures three hours a week and laboratory three hours a week.

Physics 75.291 ★

Physics of the Environment I

This course examines energy transformations which are the sources of much pollution. Topics include the use of fossil, bio-mass, solar and nuclear-energy sources, thermal pollution, radioactivity and the effects of radiation, growth in energy use and estimates of reserves, the need for conservation and control.

Prerequisites: Physics 75.101 ★, 75.102 ★ or 75.103 ★ and 75.104 ★, alternatively 75.107 ★ and 75.108 ★ with an overall grade of C- or better.

Lectures three hours a week.

Physics 75.292 ★

Physics of the Environment II

This course studies the relationship of physical principles to environmental problems. Topics considered include: air pollution, its

measurement, abatement and possible effects on climate; transportation problems and alternatives; noise pollution, its measurement and possible consequences; communication.

Prerequisites: Physics 75.101★, 75.102★ or 75.103★ and 75.104★, alternatively 75.107★ and 75.108★ with an overall grade of C- or better;

Lectures three hours a week.

Physics 75.298★

Research in Physics

This course examines how ideas in physics develop, how preconceived notions have prevented progress, how the interplay of theory and experiment are crucial. Seminars are given on current research topics. Students examine cultural and historical aspects of physics, and take part in a group project.

Prerequisites: Physics 75.101★ and 75.102★, or 75.103★ and 75.104★, alternately 75.107★ and 75.108★ with an overall grade of B- or better, or permission of the Department.

Lectures, seminars and workshops, three hours a week.

Physics 75.300

Third-Year Laboratory

Students complete a small number of independent projects in modern optics, holography, optical spectroscopy, nuclear spectroscopy, cosmic radiation, measurements, etc. Development of skills in laboratory techniques in design/construction of research apparatus.

Precludes additional credit for Physics 75.301★, 75.302★, 75.307★ and 75.308★.

Prerequisite: Physics 75.222★ and 75.235★, or permission of the Department.

Laboratory and seminar six hours a week, workshop three hours a week.

Physics 75.301★

Advanced Physics Laboratory for Non-Physics Science Students

This course is designed to initiate students into the use of instrumentation and help them understand the physical principles involved in making key measurements. In consultation with an adviser from the student's Major department, the instructor of this course will endeavour to design the program to meet the needs of each student. Available apparatus as in Physics 75.300.

Precludes additional credit for Physics 75.300 and 75.307★.

Prerequisite: Permission of the Department.

Laboratory and seminar six hours a week.

Physics 75.302★

Advanced Physics Laboratory for Non-Physics Science Students

This course is designed to initiate students into the use of instrumentation and help them understand the physical principles involved in making key measurements. In consultation with an adviser from the student's Major department, the instructor of this course will endeavour to design the program to meet the needs of each student. Available apparatus as in Physics 75.300.

Precludes additional credit for Physics 75.300 and 75.308★.

Prerequisite: Permission of the Department.

Laboratory and seminar six hours a week.

Physics 75.307★

Selected Experiments from Physics 75.300

Precludes additional credit for Physics 75.300 and 75.301★.

Prerequisites: Physics 75.222★ and 75.235★ or permission of the Department.

Laboratory and seminar six hours a week.

Physics 75.308★

Selected Experiments from Physics 75.300

Precludes additional credit for Physics 75.300 and 75.302★.

Prerequisites: Physics 75.222★ and 75.235★; or permission of the Department.

Laboratory and seminar six hours a week.

Physics 75.335★

Physics of Electrical and Electronic Measurements II

Analysis of a selection of currently important electronic devices using such concepts as Fourier analysis, noise, the transmission line; lock-in amplifier, analog to digital converter, charge sensitive detector, etc. Interfacing and programming small computers. The physical basis of operation and of limitations are emphasized.

Prerequisite: Physics 75.235★ and 75.236★ or permission of the Department.

Lectures three hours a week, laboratory three hours a week.

Physics 75.338★

Electromagnetism

Electrostatic field and magnetostatics. Examples involving Laplace's and Poisson's equations; vector potential; Faraday's laws of induction; waves in vacuum and dielectric media.

Prerequisites: Physics 75.235★ and 75.387★, or permission of the Department.

Lectures three hours a week.

Physics 75.342★

Heat and Thermodynamics

Zeroth, First, Second and Third Laws of Thermodynamics; enthalpy, Helmholtz and Gibbs functions and the Maxwell relations; phase transitions; thermodynamics of magnetism; cryogenics cooling by Joule-Thompson effect, adiabatic expansion of a gas, adiabatic demagnetization, helium dilution refrigeration; black body radiation; negative temperatures.

Prerequisites: Physics 75.211★ and 75.235★, Mathematics 69.207★, 69.208★, 69.217★ and 69.241★ or permission of the Department.

Lectures three hours a week.

Physics 75.364★

Modern Physics II

Elements of condensed matter physics - semiconductors, superconductivity. Modern optics. Elements of nuclear physics, fission and fusion methods for generating energy. Introduction to particle physics. Ionizing radiation: production, interaction with matter, detection. Medical physics: radiation biophysics, cancer therapy, imaging.

Precludes additional credit for Physics 75.366★.

Prerequisites: Physics 75.262★, Physics 75.371★; or permission of the Department.

Lectures three hours a week.

Physics 75.366★

Modern Physics II

Elements of condensed matter physics - semiconductors, superconductivity. Modern optics. Elements of nuclear physics, fission and fusion methods for generating energy. Introduction to particle physics. Ionizing radiation: production, interaction with matter, detection. Medical physics: radiation biophysics, cancer therapy, imaging.

Precludes additional credit for Physics 75.300 and 75.364★.

Prerequisites: Registration in the Applied Physics or Engineering Physics program and permission of the Department.

Lectures three hours a week, laboratory every other week.

Physics 75.371★

Elements of Quantum Mechanics

Analysis of interference experiments with waves and particles; fundamental concepts of quantum mechanics, Schrodinger equation; angular momentum, atomic beams; hydrogen atom; atomic and molecular spectroscopy; Pauli principle; simple applications in the physics of elementary particles.

Precludes additional credit for Physics 75.362★.

Prerequisite: Physics 75.262★ or 75.361★ or permission of the Department.

Lectures three hours a week.

Physics 75.381★

Classical Mechanics

Introduction to Lagrangian and Hamiltonian mechanics: Poisson brackets, tensors and dyadics; rigid body rotations: introductory fluid mechanics coupled systems and normal coordinates; relativistic dynamics.

Prerequisites: Physics 75.211★, 75.222★, 75.235★, Mathematics 69.207★, 69.208★, 69.217★, 69.241★ or permission of the Department.

Lectures three hours a week.

Physics 75.382★

Mechanics and Classical Mechanics

Motions of systems of particles and rigid bodies. Introduction to Special Relativity. Hamiltonian and Lagrangian Mechanics.

Precludes additional credit for Physics 75.211★ and 75.381★.

Prerequisite: Registration in the Applied Physics or Engineering Physics programs or permission of the Department.

Lectures three hours a week.

Physics 75.387★

Mathematical Physics I

Vector calculus; gradient, divergence, curl, Laplacian in various coordinate systems. Theorems of Gauss, Stokes and Green. Functions of a complex variable: analytic functions, contour integration, residue calculus. Fourier series, Fourier and Laplace transforms. Dirac delta function. Second order total differential equations, solution using transform methods.

Precludes additional credit for Mathematics 69.307★, 69.376★ and 70.307★, Physics 75.386.

Prerequisites: Physics 75.211★, 75.222★, 75.235★, Mathematics 69.208★, 69.217★, 69.241★, or permission of the Department.

Lectures three hours a week.

Physics 75.388★

Mathematical Physics II

Solution of second-order total differential equations by Frobenius' method. Sturm-Liouville theory. Special functions: Legendre, Bessel, Hermite, Laguerre and associated functions. Partial differential equations: method of separation of variables, eigenfunctions and eigenvalues and eigenfunction expansions. Green's function techniques for solving inhomogeneous partial differential equations. Precludes additional credit for Mathematics 69.304★, 69.375★, and Physics 75.386.

Prerequisites: Physics 75.387★ or Mathematics 70.307★; or permission of the Department.

Lectures three hours a week.

Physics 75.394★

Co-operative Work Term Report 1

Provides practical experience for students enrolled in the Co-operative option. To receive course credit students must receive satisfactory evaluations from their work term employer. Written and oral reports will be required. Graded as *Sat* or *Uns*.

Prerequisites: Registration in the Physics Co-operative option and permission of the Department.

Not transferable for academic credit.

Physics 75.395★

Co-operative Work Term Report 2

Provides practical experience for students enrolled in the Co-operative option. To receive course credit students must receive satisfactory evaluations from their work term employer. Written and oral reports will be required. Graded as *Sat* or *Uns*.

Prerequisites: Registration in the Physics Co-operative option and permission of the Department.

Physics 75.396★

Co-operative Work Term Report 3

Provides practical experience for students enrolled in the Co-operative option. To receive course credit students must receive satisfactory evaluations from their work term employer. Written and oral reports will be required. Graded as *Sat* or *Uns*.

Prerequisites: Registration in the Physics Co-operative option and permission of the Department.

Physics 75.400

Fourth-Year Laboratory

The student is expected to complete detailed projects involving some original planning in both concept and experimental technique. Projects are similar to Physics 75.300 but are of a more sophisticated nature.

Precludes additional credit for Physics 75.407★ and 75.408★.

Prerequisite: Physics 75.300 or 75.307★ or 75.308★.

Laboratory and seminar six hours a week.

Physics 75.407★

Selected Experiments from Physics 75.400

Precludes additional credit for Physics 75.400.

Prerequisite: Physics 75.300 or 75.308★.

Laboratory and seminar six hours a week.

Physics 75.408★

Selected Experiments from Physics 75.400

Precludes additional credit for Physics 75.400.

Prerequisite: Physics 75.300 or 75.307★ or 75.308★.

Laboratory and seminar six hours a week.

Physics 75.421★

Topics in Astrophysics and Cosmology

Stellar evolution, including, in particular, stellar modelling, main sequence stars, red giants and the end states of stars. Introduction to general relativity, black holes and related phenomena, big bang cosmology.

Prerequisites: Physics 75.223★, 75.224★, 75.262★ or 75.361★, 75.371★ or 75.362★; or permission of the Department.

Lectures three hours a week.

Physics 75.423★

Physical Applications of Fourier Analysis

Laplace transform and its application to electrical circuits. Fourier transform, convolution. Sampling theorem. Applications to imaging: descriptors of spatial resolution, filtering. Correlation, noise power. Discrete Fourier transform, FFT. Filtering of noisy signals. Image reconstruction in computed tomography and magnetic resonance. Integral transforms and their application to boundary value problems.

Precludes additional credit for Physics 75.424★.

Prerequisite: Physics 75.387★; or permission of the Department.

Lectures three hours a week.

Physics 75.428★

Modern Optics

Laser theory: stimulated emission, cavity optics, modes; gain and bandwidth; Gaussian beams; atomic and molecular lasers. Mode locking, Q switching. Diffraction theory, coherence, Fourier optics, holography, laser applications. Optical communication systems: nonlinear effects - devices, fiber optics, fiber sensors, integrated optics.

Precludes additional credit for Physics 75.427★.

Prerequisites: Physics 75.222★, 75.338★, 75.364★, 75.371★ or 75.362★; or permission of the Department.

Lectures three hours a week.

Physics 75.437★

Electromagnetic Radiation

Electromagnetic wave propagation in a vacuum, dielectrics, conductors, and ionized gases, reflection, refraction, polarization at the

plane boundary between two media; waveguide and transmission line propagation; dipole and quadrupole radiation fields; antenna systems. Electromagnetic mass, radiation pressure. Tensor notation, transformation of the electromagnetic fields.

Prerequisites: Physics 75.338 ★, 75.381 ★, 75.387 ★ and 75.388 ★ (except for Mathematics and Physics Double Honours students), or permission of the Department.
Lectures three hours a week.

Physics 75.447 ★

Statistical Physics

Equilibrium statistical mechanics and its relation to thermodynamics. Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac statistics are derived, and applied in appropriate physical situations. Fluctuations. Kinetics and transport processes, including the Boltzmann transport equation and some of its applications.

Prerequisite: Physics 75.342 ★, 75.262 ★ or 75.361 ★, 75.371 ★ or 75.362 ★, 75.477 ★ (may be taken concurrently); or permission of the Department.

Lectures three hours a week.

Physics 75.449 ★

Thermodynamics and Statistical Physics

The three Laws of Thermodynamics, enthalpy, Helmholtz and Gibbs functions and the Maxwell relations. Equilibrium statistical mechanics and its relation to thermodynamics. Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac statistics.

Precludes additional credit for Physics 75.342 ★ and 75.447 ★.

Prerequisites: Registration in the Applied Physics or Engineering Physics program and permission of the Department.

Lecture three hours a week.

Physics 75.458 ★

Solid State Physics

An introduction to solid state physics. Topics include crystal structure, phonons and lattice vibrations, conductors, semiconductors, insulators and superconductivity.

Prerequisites: Physics 75.262 ★ or 75.361 ★, 75.371 ★ or 75.362 ★; or permission of the Department.

Lectures three hours a week.

Physics 75.462 ★

Particle Physics

Properties of leptons, quarks and hadrons. The fundamental interactions, conservation laws, invariance principles and quantum numbers. Resonances in hadron-hadron interactions. Three body phase space. Dalitz plots. Quark model of hadrons, mass formulae. Weak interactions, parity violation, decay of neutral kaons, CP violation, Cabibbo theory. Also offered at the graduate level, with additional or different requirements, as Physics 75.562, for which additional credit is precluded.

Prerequisite: Physics 75.477 ★ or permission of the Department.

Lectures three hours a week.

Physics 75.468 ★

Nuclear Physics

Ground state properties of nuclei, nuclear forces, nuclear levels. Qualitative treatment of Fermi gas model, liquid drop model, shell model and collective model. Alpha, beta and gamma radioactivities. Fission. Passage of particles through matter. Particle detectors. Elements of neutron physics and nuclear reactors.

Prerequisites: Physics 75.361 ★ and 75.362 ★ or permission of the Department.

Lectures three hours a week.

Physics 75.477 ★

Introduction to Quantum Mechanics I

The basic interpretative postulates of quantum mechanics are applied to simple one-dimensional problems, and angular momentum theory.

Prerequisites: Physics 75.371 ★ or 75.362 ★, 75.387 ★, 75.388 ★; or permission of the Department.

Lectures three hours a week.

Physics 75.478 ★

Introduction to Quantum Mechanics II

Scattering theory and application; bound state problems; approximation methods.

Prerequisite: Physics 75.477 ★ or permission of the Department.

Lectures three hours a week.

Physics 75.487 ★

Computational Physics

The UNIX operating system. Numerical methods for solving problems in linear algebra, interpolation, integration, root finding, minimization, and differential equations. Monte Carlo methods for simulation of random processes. Statistical methods for parameter estimation and hypothesis tests. Chaotic dynamics. Also offered at the graduate level, with additional or different requirements, as Physics 75.502, for which additional credit is precluded.

Prerequisite: Permission of the department and an ability to program in FORTRAN, C, or C++.

Lectures three hours a week.

Physics 75.491 ★

Special Topics in Physics

Each year, at the direction of the Department, a course on a special topic may be offered.

Prerequisite: Permission of the Department.

Physics 75.495 ★

Cooperative Work Term Report 4

Provides practical experience for students enrolled in the Co-operative option. To receive course credit students must receive satisfactory evaluations from their work term employer. Written and oral reports will be required. Graded as *Sat* or *Uns*.

Prerequisites: Registration in the Physics Co-operative education option and permission of the Department.

Physics 75.496 ★

Cooperative Work Term Report 5

Provides practical experience for students enrolled in the Co-operative option. To receive course credit students must receive satisfactory evaluations from their work term employer. Written and oral reports will be required. Graded as *Sat* or *Uns*.

Prerequisites: Registration in the Physics Co-operative education option and permission of the Department.

Physics 75.497 ★

Fourth-Year Project

Same as Physics 75.499 except that it extends over the Fall term only. (See Physics 75.499 for details.)

Prerequisite: Permission of the Department.

A minimum of six hours laboratory or private study a week.

Physics 75.498 ★

Fourth-Year Project

Same as Physics 75.499 except that it extends over the Winter term only. (See Physics 75.499 for details.)

Prerequisite: Permission of the Department.

A minimum of six hours laboratory or private study a week.

Physics 75.499

Fourth-Year Project

These are advanced projects of an experimental or theoretical nature with an orientation towards research. A written progress report, by mid-term for Physics 75.497 ★, 75.498 ★, and by mid-year for Physics 75.499, must be submitted to the student's supervisor prior to the last day for withdrawal from the course. A written and an oral report is required at the conclusion of the project.

Prerequisite: Permission of the Department.

A minimum of six hours laboratory or private study a week.

Political Science

(Public Affairs and Management)

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Academic Administration

Chair, Glen Williams

Assistant Chair, Laura Macdonald

Supervisor of Graduate Studies, Piotr Dutkiewicz

Supervisor of Undergraduate Studies, Francois Rocher

Teaching Staff

Professors Emeriti

Douglas G. Anglin • Henry B. Mayo • Kenneth D. McRae • Teresa Rakowska-Harmstone • Donald C. Rowat

Professors

Tom Darby, A.B. (Mercer), M.A. (Georgia State), Ph.D. (York) • **Joan De Bardeleben**, B.A., M.A., Ph.D. (Wisconsin) • **M.B. Dolan**, A.B. (Harvard), M.A., Ph.D. (The American University) • **Piotr Dutkiewicz**, L.L.M. (Warsaw), Ph.D. (Soviet Academy of Science) • **Peter Emberley**, B.A. (British Columbia), M.A. (Toronto), Ph.D. (London School of Economics) • **Carl G. Jacobsen**, B.A. (Carleton), M.Phil., Ph.D. (Glasgow) • **Maureen A. Molot**, B.A., M.A. (McGill), Ph.D. (California at Berkeley) • **Lynn K. Mytelka**, Ph.D. (Johns Hopkins) • **Waller R. Newell**, B.A., M.A. (Toronto), M.Phil., Ph.D. (Yale) • **Jon H. Pammett**, B.A., M.A. (Queen's), Ph.D. (Michigan) • **Harald von Riekhoff**, B.A. (Western Ontario), M.A., Ph.D. (Yale) • **Sharon Sutherland**, B.A., M.A. (Alberta), Ph.D. (Essex) • **Richard Van Loon**, B.Sc., M.A. (Carleton), Ph.D. (Queen's) • **Jill McCalla Vickers**, B.A. (Carleton), Ph.D. (London) • **Glen Williams**, B.A., M.A., Ph.D. (York) • **Conrad J. Winn**, B.A. (McGill), Ph.D. (Pennsylvania)

Associate Professors

Jon Alexander, M.A. (Southern Illinois), Ph.D. (Kansas) • **David Bellamy**, B.A. (Carleton), M.A. (Queen's) • **Scott E. Bennett**, B.A. (Chicago), M.A., Ph.D. (York) • **Chris Brown**, B.A. (Toronto), M.A., Ph.D. (Cornell) • **Andrea S. Chandler**, B.A. (Dalhousie), M.A. (Carleton), M. Phil., Ph.D. (Columbia) • **Vincent Della Sala**, B.A. (McGill), M.A. (New York), D. Phil. (Oxford) • **Piotr Dutkiewicz**, L.L.M. (Warsaw), Ph.D. (Soviet Academy of Science) • **Linda Freeman**, B.A. (British Columbia), M.A., Ph.D. (Toronto) • **Barbara Jenkins**, B.A. (McGill), M.A. (Carleton), M.Phil., Ph.D. (Yale) • **C. Radha Jhappan**, B.A. (Oxford), M.A., Ph.D. (British Columbia) • **Laura Macdonald**, B.A. (Queen's), M.A., Ph.D. (York) • **Edward Osei-Kwadwo Prempeh**, B.A. (Ghana), M.A. (Alberta), Ph.D. (Carleton) • **Jeremy T. Paltiel**, B.A. (Toronto), M.A., Ph.D. (California at Berkeley) • **François Rocher**, B.Sc., M.Sc., Ph.D. (Montréal) • **Miriam Smith**, B.A. (McGill), M.A., M.Phil., Ph.D. (Yale) • **E.L. Tepper**, B.A. (Michigan), M.A. (American), Ph.D. (Duke)

Assistant Professors

Rebecca Kukla, B.A. (Toronto), Ph.D. (Pittsburgh) • **Daniel T. Osabu-Kle**, B.Eng (Karachi), P.T.S.C. (Institute of Armament Technology), M.A., Ph.D. (Carleton) • **Edward Osei-Kwadwo Prempeh**, B.A. (Ghana), M.A. (Alberta), Ph.D. (Carleton) • **Fiona Robinson**, B.A. (Queen's), M.A. (Carleton), Ph.D. (Cambridge) • **William Walters**, B.Sc. (London, M.A. (CUNY), Ph.D. (York)

Distinguished Research Professors

R.J. Jackson • V. Subramaniam

Adjunct Professors

P.V. Lyon • W.A. Mullins • G. Roseme • P.L. Rosen • J.H. Sigler • M.S. Whittington • V.S. Wilson

General Information

Ottawa provides a wealth of resources, both in personnel and in research materials, for the student of government, politics, public affairs and policy analysis and international relations. Undergraduates will be assisted in making the fullest use of these unique advantages of the national capital. The Department of Political Science offers courses in the following fields of study: Canadian government and politics, comparative institutions and politics, public administration and public policy, international relations, political theory and methodology.

Graduation Regulations

In order to graduate, students must fulfill all University graduation regulations (see p. 48), all Faculty regulations including those for First-Year Seminars and Breadth requirements (see p. 63), and all Major regulations and requirements as set out below.

Calculation of Political Science GPA

For the purpose of admission to, continuation in, and graduation from Political Science programs, the departmental GPA will be calculated over all successful attempts in the discipline.

For the purpose of calculating Class of Honours at graduation, only those courses needed to meet Political Science program requirements (exclusive of language requirement) will be included in the calculation of the departmental GPA.

Honours Programs

The Honours programs may be entered in the First year, or by transfer from B.A. degree programs, if sufficient standing has been obtained. A B.A. (Honours) student may apply to graduate with a B.A. degree at the end of the Third year if the requirements under that degree program have been completed. The following programs are available:

B.A. (Honours) in Political Science

For full Honours, 20.0 credits will be required, including at least 9.0 credits in Political Science. The Political Science credits must comprise:

1. Political Science 47.100, 47.230, and 47.270;
2. 1.0 credit chosen from the following list of courses in Canadian government and politics: Political Science 47.200, 47.201, 47.300★, 47.301★, 47.302★, 47.303★, 47.304★, 47.305★, 47.306★, 47.307★, 47.335★, 47.336★, 47.340, 47.341★, 47.342★, 47.346★, 47.366★, 47.367★, 47.400, 47.401, 47.402★, 47.403★, 47.406★, 47.407★, 47.408★, 47.409★, 47.411★, 47.416★, 47.417★, 47.418★, 47.419★, 47.441★;
3. 1.0 credit chosen from the following list of courses in comparative politics and international relations: Political Science 47.215, 47.260, 47.309★, 47.310★, 47.311★, 47.312★, 47.313★, 47.314, 47.315, 47.316★, 47.317★, 47.320, 47.322, 47.323, 47.323★, 47.324★, 47.325★, 47.326★, 47.327★, 47.328★, 47.329★, 47.332★, 47.337★, 47.344★, 47.345★, 47.350★, 47.351★, 47.352★, 47.360★, 47.361★, 47.362★, 47.363★, 47.365★, 47.366★, 47.373★, 47.405★, 47.412★, 47.413★, 47.414★, 47.415★, 47.420★, 47.421★, 47.422★, 47.423★, 47.440★, 47.450★, 47.455★, 47.460, 47.461★, 47.463★, 47.464★, 47.466★, 47.467★, 47.482★, 47.483★, 47.484★;
4. 3.0 additional credits in Political Science, of which the equivalent of at least 1.0 credit must be from the 400-level seminars and must be taken at Carleton University.

5. Candidates with Fourth-year Honours standing in Political Science and a GPA of 9.0 or better in Political Science courses are strongly encouraged to present an Honours essay on some topic involving independent investigation (Political Science 47.498); they may be examined orally on this essay and must receive a B- or better in this course. Political Science 47.498 must be taken at Carleton University. Any Honours student with a GPA below 9.0 in Political Science courses who wishes to present an Honours essay may do so with the agreement of a faculty supervisor and the permission of the Supervisor of Undergraduate Studies.

Students who do not write an Honours essay are required to complete 1.0 replacement credit in Political Science in the form of one or more 400-level seminars.

6. Language requirement: The Department requires Honours students to demonstrate proficiency in at least one language other than English, normally French. Honours students are required to demonstrate such proficiency, normally through the completion of any First-year course (or its approved equivalent) in a language offered at Carleton.

For students who consider that they already have proficiency in a second language, the Department conducts a French language examination once a year in November. For other languages, the onus is on the student to provide suitable documentary evidence of proficiency to the Department.

Combined B.A. (Honours)

Students intending to enter a program combining Political Science with another discipline should, in their First year, take Political Science 47.100 and the introductory course in the other discipline. For Combined Honours a minimum of 7.0 credits in Political Science will be required, including:

1. Political Science 47.100, 47.230, 47.270 or its equivalent; 2.0 credits chosen from the 400-level courses in Political Science;
2. The equivalent of 2.0 credits, chosen from requirements 2 and/ or 3 listed for the full Honours program. The 2.0 credits may be chosen from one list; one of the 2.0 credits may be the 400-level seminar;

3. The language requirement as stated for Honours (item 6 above) in Political Science must be completed;

4. The requirements as stated for Combined Honours in the other discipline of the Combined program must be met.

Concentrations in B.A. (Honours) and Combined B.A. (Honours) Programs

Concentrations provide an opportunity for focused study in several specialized fields offered by the Department. In addition to meeting the general requirements for a Political Science Honours, Combined Honours, or B.A. degree, students are required to complete a selection of core and optional courses in their Concentration. A GPA of 6.5 or better must be maintained in the Concentration courses. On successful completion of all requirements for the Concentration, the name of the Concentration will be added to the student's transcript and diploma.

An Honours degree in Political Science with a Concentration requires at least 9.0 but not more than 12.0 Political Science credits. No credits beyond this maximum permissible total may be counted towards the 20.0 credits required for the degree. When a Concentration is pursued within Political Science in the context of a Combined B.A. (Honours) degree the maximum number of credits in Political Science counting towards the degree will be 9.0. Concentrations are also open to students in the B.A. program in Political Science. However, it may be difficult to meet the requirements of the Concentrations within the 15.0 credits required for the B.A. degree, so that courses extra to the primary degree may have to be taken.

Five different Concentrations are available to Majors in Political Science: Canadian Politics; Comparative Politics and Area Studies; International Relations; Political Theory; and, Public Affairs and Policy Analysis. Each Concentration requires 3.5 specific credits in Political Science as follows:

Concentration in Canadian Politics

47.200 or 47.201 plus 2.5 Canadian Politics credits chosen from: 47.300★, 47.301★, 47.302★, 47.303★, 47.304★, 47.305★, 47.306★, 47.307★, 47.335★, 47.336★, 47.341★, 47.342★, 47.346★, 47.366★, 47.367★, 47.400, 47.402★, 47.403★, 47.406★, 47.407★, 47.408★, 47.409★, 47.411★, 47.416★, 47.417★, 47.418★, 47.419★, 47.441★, 47.498 (for qualified Honours students on an accepted Canadian Politics theme). At least 0.5 credit from this list must be completed at the 400-level.

Concentration in Comparative Politics and Area Studies

47.215 plus 2.5 Comparative Politics and Area Studies credits chosen from: 47.309★, 47.310★, 47.311★, 47.312★, 47.313★, 47.314, 47.315, 47.316★, 47.319★, 47.322, 47.323★, 47.324★, 47.325★, 47.326★, 47.327★, 47.328★, 47.329★, 47.332★, 47.344★, 47.345★, 47.350★, 47.351★, 47.352★, 47.373★, 47.405★, 47.412★, 47.413★, 47.414★, 47.415★, 47.420★, 47.421★, 47.422★, 47.423★, 47.424★, 47.425★, 47.426★, 47.427★, 47.450★, 47.455★, 47.461★, 47.466★, 47.482★, 47.483★, 47.484★, 47.498 (for qualified Honours students on an accepted Comparative Politics and Area Studies theme). At least 0.5 credit from this list must be completed at the 400-level.

Concentration in International Relations

47.260 plus 2.5 International Relations credits chosen from:

47.309★, 47.317★, 47.360★, 47.361★, 47.363★, 47.365★, 47.366★, 47.367★, 47.373★, 47.460, 47.461, 47.463★, 47.464★, 47.466★, 47.467★, 47.482★, 47.483★, 47.484★, 47.498 (for qualified Honours students on an accepted International Relations theme). At least 0.5 credit from this list must be completed at the 400-level.

Concentration in Political Theory

47.230 plus 2.5 Political Theory credits chosen from:

47.330★, 47.332★, 47.333, 47.334, 47.335★, 47.336★, 47.337★, 47.431★, 47.432★, 47.434, 47.435, 47.436★, 47.437★, 47.498 (for qualified Honours students on an accepted Political Theory theme). At least 0.5 credit from this list must be completed at the 400-level.

Concentration in Public Affairs and Policy Analysis

47.270 plus 2.5 Public Affairs and Policy Analysis credits chosen from:

47.240, 47.341★, 47.342★, 47.344★, 47.345★, 47.346★, 47.347★, 47.402★, 47.403★, 47.407★, 47.408★, 47.420★, 47.400C, 47.417★, 47.424★, 47.441★, 47.446★, 47.447★, 47.448★, 47.471★, 47.472★, 47.498 (for qualified Honours students on an accepted Public Affairs and Policy Analysis theme). At least 0.5 credit from this list must be completed at the 400-level.

Combined Honours, Journalism and Political Science

Students admitted to Journalism prior to 1995-96, may select a course pattern that will lead either to the degree of B.A. with Combined Honours in Journalism and Political Science, in which case the Honours Essay will be written for the Department of Political Science, or to the degree of B.J. with Combined Honours in Political Science, in which case the Honours Essay will be written for the School of Journalism and Communication. Students in either program must complete 20.5 credits, and they must maintain a standing sufficiently high at all times to satisfy the standards of both the School of Journalism and Communication and the Department of Political Science. Students admitted to Journalism in 1995-96 or later must complete 20.0 credits. If they wish to graduate with a B.A. they must complete the Honours essay in Political Science; otherwise, the degree awarded will be the B.J. (Hons.). Please refer to the statement of standing on p. 308 (Journalism) and faculty regulations, p. 74.

Course requirements are:

1. A minimum of 7.0 credits in Political Science including: 47.100, 47.230, 47.270 or its equivalent, 2.0 credits chosen from requirements 2 and/or 3 listed for Honours in Political Science, 2.0 credits from the 400-level courses in Political Science.
2. For those students admitted to Journalism from 1995-96 on, the Journalism courses normally required under the Honours Journalism program, include Journalism 28.100, 28.221, 28.225★, 28.251★, 28.325, 28.326, 28.400, 28.421 and two of 28.425★, 28.426★, 28.427★, 28.428★. Students should consult the School of Journalism and Communication on course patterns. Students admitted to Journalism prior to 1995-96 should consult the School of Journalism and Communication for requirements.
3. The language requirement as stated for Honours in Political Science (item 6 above) must be completed.
4. An approved course in Canadian history. (Students who wish to practise journalism in another country may be advised to choose a different history course.)

Combined Honours, Political Science and Economics

Students in this program are required to complete at least 6.0 credits in Political Science including Political Science 47.100, 47.230, and 47.270 and the equivalent of 2.0 credits from the 400-level seminars in Political Science.

Students must also meet requirements 2, 3 and 4 as stated for Combined Honours in Political Science.

Combined Honours, Political Science and Sociology

Students in this program are required to complete 7.0 credits in Political Science including Political Science 47.100, 47.230, and the equivalent of 2.0 credits from the 400-level seminars in Political Science. In addition, the student must complete one of the following methodology sequences:

(a) in the Second year, Political Science 47.270; in the Third year, Sociology, 53.370; or

(b) in the Second year, Sociology 53.203 or Anthropology 54.203 (Sociology 53.203 is recommended); in the Third year, Political Science 47.471★ and 47.472★. Students should note that Political Science 47.471★ and 47.472★ may not be offered every year.

Students must also meet requirements 2, 3 and 4 as stated for Combined Honours in Political Science.

Note: See also p. 442 and consult the Department of Sociology and Anthropology.

Combined Honours, Political Science and Human Rights

Students in this program are required to complete at least 6.0 credits in Political Science including Political Science 47.100, 47.230, and 47.270, and the equivalent of 2.0 credits from the 400-level seminars in Political Science.

Students must also meet requirements 2, 3 and 4 as stated for Combined Honours in Political Science.

Note: See also p. 283.

Honours and Combined Honours Standing

Students must maintain a standing sufficiently high at all times to satisfy Faculty requirements. (See p. 71.)

B.A. Programs

A B.A. program in Political Science requires Political Science 47.100; one of 47.230 or 47.270; and 4.0 or more additional credits in Political Science.

First-year students intending to enter a B.A. or B.A. (Honours) program in Political Science should note that they may take a 200-level course concurrently with Political Science 47.100.

B.A. students should take a number of courses in related social sciences. Final-year B.A. students with the required standing may, with permission, be admitted to 400-level Honours courses, provided space is available. The entire program must be approved by the Department.

B.A. students must maintain a GPA of 4.0 in Political Science.

Minor in Political Science

Students registered in degree programs other than the Bachelor of Arts in Political Science, and who are in good standing in their program of study, may register for the Minor in Political Science. On successful completion of all requirements, the designation "Minor in Political Science" will be added to the student's transcript and diploma.

The requirements of the Minor in Political Science are 4.0 credits with a GPA of 4.0 or better, including:

1. 1.0 credit chosen from 47.100, 01.131, 01.132, 01.133, 01.134, 01.135
2. 1.0 credit chosen from 47.200, 47.201, 47.215, 47.230, 47.240, 47.260, 47.270.
3. 2.0 additional credits in Political Science.

Students wishing to pursue a Minor in Political Science register through the Registrarial Services Office. To remain in the Minor program in Political Science, students must maintain a GPA of 4.0 or better in the Minor courses. Standing will be regularly audited once a registered student has completed 1.0 credit in the Minor courses, and students who fail to maintain the required GPA will be deregistered from the Minor.

Students in some degree programs may not have sufficient "free"

electives to complete the requirements for the Minor in Political Science within the normal number of courses designated for their degree. In such cases, students choosing to pursue the Minor option, with its additional certification, will have to fulfill the requirements of the Minor over and above the requirements of their primary degree program.

Mention: français

Students who wish to qualify for the "Mention: français" notation in Political Science may do so by taking the following pattern of courses in their degree program:

1. 1.0 credit in the advanced study of the French language (a minimum of French 20.160).
2. 1.0 credit in French-Canadian culture and heritage (two of French 20.267 ★, 20.268 ★, 20.281 ★ or 20.270).
3. One of Political Science 47.201 or 47.390. Political Science 47.201 is recommended.
4. Honours students are required to take Political Science 47.499 or one of 47.201 or 47.390, whichever was not used to meet requirement 3.

With the prior approval of the Department, students may substitute appropriate courses taught in French at the University of Ottawa for requirements 2 and 4.

Carleton-Leeds Parliamentary Internship Exchange

The Carleton-Leeds Parliamentary Internship Exchange is a unique opportunity for Honours and Combined Honours students in their fourth year of Political Science to combine academic study with parliamentary internships in Canada and the United Kingdom. Students participating in the exchange spend the Fall term in Ottawa and the Winter term in London. They spend four days a week in each city serving as parliamentary interns. In addition, they take courses offered by Carleton and Leeds Universities. More information and application forms are available from the Department of Political Science or from Carleton International.

Graduate Program

The Department of Political Science offers studies leading to the degree of Master of Arts and to the degree of Doctor of Philosophy. For further details consult the Graduate Studies and Research Calendar.

Requirement for Breadth, for students in B.A. or B.A.(Honours) degrees

Category for Breadth	Courses in this unit
The temporal dimension of human societies, analyzing times before the present era or societies other than our own	
The artifacts of the imagination in literature and/or other forms, or that addresses the life of the imagination and culture.	
The understanding of social, technological and/or natural processes and the ways in which that understanding is obtained in science and social science.	All Political Science courses not listed in any other category
Matters of human values, ethics and social responsibilities	(47.)230

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Prerequisites

Except in special circumstances, students are required to have taken the prerequisites listed in the Calendar. Appropriate experience and/or equivalent academic background may be substituted with the permission of the Department.

First Year

First-Year Seminar in Political Science 01.131

Global Political Cultures

The political role of culture in a global context. The integral role of architecture, art, landscape and film in legitimating, popularizing and propagating political endeavours. The imperialism of cultural exchanges between developed and developing countries. Limited enrolment.

Precludes additional credit for Political Science 47.111 ★

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminar three hours a week.

First-Year Seminar in Political Science 01.132

North American Politics

A comparative examination of North American political institutions and continental economic integration. Special attention to the political implications of economic integration. Limited enrolment. Precludes additional credit for Political Science 47.112 ★.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminar three hours a week.

First-Year Seminar in Political Science 01.133

Social Impact of Transformation in the Post Communist Era
Political, economic and social changes that have accompanied the collapse of the Berlin Wall. The role of the society in these political upheavals and the impact of the end of the Cold War on reform in Western and developing countries. Limited enrolment.

Precludes additional credit for Political Science 47.113 ★, European and Russian Studies 55.113 ★ and First-Year Seminar 01.102.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminar three hours a week.

First-Year Seminar in Political Science 01.134

Politics of Race

Meaning, sources and practice of racialism, as well as efforts to combat it, in a comparative context. Case studies include South Africa, the United States, and Canada. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminar three hours a week.

First-Year Seminar in Political Science 01.135

Indigenous Politics

Struggles of indigenous peoples against colonial dispossession and for political autonomy, rights to land and resources, protection of sacred sites, language and cultural revival. Case studies will include Australia, Canada, Mexico, New Zealand and the United States.

Precludes additional credit for Political Science 47.115 ★

Prerequisite: Normally restricted to students entering the first year of a B.A. program.

Seminar three hours a week.

Political Science 47.100

Introduction to Political Science

Contemporary political issues and problems: political thought, focusing upon the clash of modern ideologies; comparative government, starting from the Canadian system, and including one other western democracy, a post-communist system and a developing country; international politics; methods of enquiry. Lectures three hours a week.

Political Science 47.111 ★

Global Political Cultures

The political role of culture in a global context. Investigates the integral role of architecture, art, landscape and film in legitimating, popularizing and propagating political endeavours. The imperialism of cultural exchanges between developed and developing countries. Precludes additional credit for First-Year Seminar 01.131. Lectures three hours a week.

Political Science 47.112 ★

North American Politics

A comparative examination of North American political institutions and continental economic integration. Special attention will be given to the political implications of economic integration. Precludes additional credit for First-Year Seminar 01.132. Lectures three hours a week.

Political Science 47.113 ★

Social Impact of Transformation in the Post Communist Era

The political, economic and social changes that have accompanied the collapse of the Berlin Wall. Examines the role of the society in these political upheavals and the impact of the end of the Cold War on reform in Western and developing countries. Precludes additional credit for First-Year Seminar 01.102, 01.133 and European and Russian Studies 55.113 ★. Lectures three hours a week.

Political Science 47.114 ★

Politics of Race

This course examines the meaning, sources and practice of racialism, as well as efforts to combat it, in a comparative context. Case studies will include South Africa, the United States, and Canada. Precludes additional credit for First-Year Seminar 01.134. Lectures three hours a week.

Political Science 47.115 ★

Indigenous Politics

Struggles of indigenous peoples against colonial dispossession and for political autonomy, rights to land and resources, protection of sacred sites, language and cultural revival. Case studies will include Australia, Canada, Mexico, New Zealand and the United States. Precludes additional credit for First-Year Seminar 01.135. Lectures three hours a week.

Second Year

Political Science 47.200

Canadian Politics

Canadian political institutions, federalism, constitutional politics, and the major political, cultural, social and economic forces that animate Canadian politics. Prerequisite: Second-year standing. Lectures three hours a week.

Political Science 47.201

Introduction à la politique canadienne

Une vue générale du processus politique et des institutions politiques au Canada. Travaux peuvent être présentés en français ou en anglais. Precludes additional credit for Political Science 47.200. Prerequisite: Second-year standing. Lectures three hours a week.

Political Science 47.215

Comparative Politics

Concepts, theories and methods employed in the study of comparative politics, with particular emphasis on cross-national comparison of regimes and some of the major issues in the field. Prerequisite: Second-year standing. Lectures three hours a week.

Political Science 47.230

History of Political Thought

Western political thought from classical times to the nineteenth century: Plato, Aristotle, Machiavelli, Hobbes, Locke, Rousseau and other thinkers. Precludes additional credit for Political Science 47.231. Prerequisite: Second-year standing. Lectures three hours a week.

Political Science 47.240

Introduction to Public Administration and Public Policy

The important concepts, institutions, and processes in the fields of public administration and public policy. Theoretical, empirical, and applied foundations of these fields will be considered. Precludes additional credit for Political Science 47.340. Prerequisite: Second-year standing. Lectures three hours a week.

Political Science 47.260

International Relations

Global politics and the international political economy. Topics include: war, terrorism, nuclear proliferation, the implications of a post-Cold War world, contemporary changes in the global political economy, and relations between rich and poor countries. Prerequisite: Second-year standing. Lectures three hours a week.

Political Science 47.270

Quantitative Political Science Research Methods

Quantitative research methods used in political science. The logic and nature of the quantitative study of politics, research design, data collection methods, and statistical techniques for data analysis. Packaged computer programs used to analyze political and policy-related data. Prerequisite: Second-year standing. Lectures three hours a week.

Third Year

Political Science 47.300 ★

Canadian Provincial Politics

A comparative examination of the nature of Canadian provincial politics. Topics include: political culture, history, party systems, electoral systems and voting behaviour. Prerequisite: Third-year standing. Lectures three hours a week.

Political Science 47.301 ★

Canadian Intergovernmental Relations

The main conceptual approaches to the structures and socio-economic processes of Canadian intergovernmental relations including selected policy fields in intergovernmental relations. Prerequisite: Third-year standing. Lectures three hours a week.

Political Science 47.302 ★

Canadian Municipal Government

The nature and problems of Canadian municipal government, including metropolitan and regional government and provincial-municipal relations. Prerequisite: Third-year standing. Lectures three hours a week.

Political Science 47.303 ★

Canadian Urban Politics

The nature and problems of Canadian urban politics.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.304 ★

Political Parties and Elections in Canada

The evolution of the party system, the growth of major and minor party movements and the electoral process in Canada.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.305 ★

Ontario Government and Politics

A survey of the political process and political institutions in Ontario.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.306 ★

Social Power in Canadian Politics

The role of social forces in the Canadian political process, including interest groups, social movements, elites and classes.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.307 ★

Constitutional Politics in Canada

The politics of the Canadian constitution. Particular attention to historical and contemporary constitutional reform.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.310 ★

Politics of Development in Africa

The historical background of African independence, and contemporary struggle for democracy and economic development in Africa.

Precludes additional credit for Political Science 47.310.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.311 ★

Politics of War in Africa

The recurrent crises of war, and political instability in Africa, along with regional and international efforts to resolve them.

Precludes additional credit for Political Science 47.310.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.312 ★

Politics of Development of China

The evolving structures and processes of government in (greater) China with particular emphasis on politics in the People's Republic of China and secondary emphasis on Taiwan and Hong Kong.

Precludes additional credit for Political Science 47.312.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.313 ★

State, Society and Economy in Northeast Asia

The relationship between government structures, society and the economy in Northeast Asia with particular emphasis on Japan and Korea.

Precludes additional credit for Political Science 47.312.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.314

Politics in Central and Eastern Europe

A comparative examination of political institutions and processes in the states of Central and Eastern Europe.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.315

Government and Politics of South and South-East Asia

The patterns of colonial history, emergent political regimes and problems of development and foreign policy in the countries from Pakistan through the Philippine Islands, with special emphasis on problems of political change.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.316 ★

Revolution

Theories of revolution from Aristotle through the present era. Revolution as a concept, and as an empirical fact of central importance to our age.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.317 ★

The Causes of War

Alternate theories of the causes of war. Such alternate perspectives as biological, social and comparative historical approaches, including the results of peace research activities of the past two decades.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.319 ★

The Politics of Law and Morality

Politics of moral regulation in Canada, the United States and other jurisdictions. The treatment in law and public policy of such human rights issues as: capital punishment, sexual orientation, euthanasia, abortion, new reproductive technologies, racial discrimination, religious and equality rights.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.322

Government and Politics of the United States

American political thought, constitutional development, and the governmental process.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.323 ★

Government and Politics in the Middle East

The evolution and functioning of political systems in the Middle East region, with emphasis on the problems of political stability, the impact of the West, the role of Islam, and war and peace.

Precludes additional credit for Political Science 47.362 ★.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.324 ★

Politics of Latin America

An overview of the evolution of Latin American political systems, including the impact of the European conquest, democratization, economic liberalization, state-civil society relations, gender politics, revolutionary movements, and relations with the United States.

Precludes additional credit for Political Science 47.311.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.325 ★

Mexican Politics

An introduction to the politics, society and economy of Mexico. Topics include processes of democratization and economic liberali-

zation, human rights, the environment, the role of women, labour, and indigenous peoples, and social policy. Special emphasis on Mexico's role in the North American political economy. Precludes additional credit for Political Science 47.311. Prerequisite: Third-year standing. Lectures three hours a week.

Political Science 47.326 ★

The Government and Politics of Western Europe

Changes in West European states and societies. Major institutions, structures and processes, with an emphasis on how European states are responding to social, political and economic changes. Precludes additional credit for Political Science 47.321. Prerequisite: Third-year standing. Lectures three hours a week.

Political Science 47.327 ★

The Government and Politics of European Integration

The processes of integration and disintegration in Western Europe; the European Union as an emerging political body that is shaping European politics. The evolution of European integration, and examination of the forces driving the move to an ever closer union. Precludes additional credit for Political Science 47.321. Prerequisite: Third-year standing. Lectures three hours a week.

Political Science 47.328 ★

Reform and Political Change in the Russian Federation

The ongoing process of post-Soviet reform in Russia: the implications of market reform; the process of democratization; and constitutional change in Russia's federal system. Historical perspectives from the Soviet experience, and comparative insights with the other Soviet successor states. Precludes additional credit for Political Science 47.320. Prerequisite: Third-year standing. Lectures three hours a week.

Political Science 47.329 ★

Politics, Sovereignty and Identity in Russia and the Soviet Successor States

Comparative statebuilding and social change in the successor states of former Soviet Union. The contentious processes of political institution-building, the emergence of new social identities, and the importance of ethnicity in the current politics of the region. Precludes additional credit for Political Science 47.320. Prerequisite: Third-year standing. Lectures three hours a week.

Political Science 47.330 ★

Politics and Literature

A study of imaginative prose in which political ideas and/or political settings dominate. Literature as political communication, the impact of literature upon politics, the peculiar value of literature in the study of politics, its shortcomings. Prerequisite: Third-year standing. Lectures three hours a week.

Political Science 47.331 ★

Politics and Psychoanalytic Thought

The contribution of psychoanalytic thought to political and social theory. Emphasis on the origin and function of culture, instinct modification, perversion, character and political order; the psychoanalytic ethic and the therapeutic state; the Freudian-Marxist dialectic and the critique of society. Prerequisite: Political Science 47.230 or permission of the Department. Lectures three hours a week.

Political Science 47.332 ★

Asian Political Thought

A comparative treatment of Asian political thought emphasizing

the Chinese, Indian and Islamic perspectives.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.333

Modern Political Thought and Ideologies

An analysis of leading political concepts and ideologies since 1800, including utilitarianism, liberalism, conservatism, socialism and fascism.

Prerequisite: Political Science 47.230 or permission of the Department.

Lectures three hours a week.

Political Science 47.334

Ancient and Medieval Political Thought

The significance for political theory of the ancient and medieval controversies over nature/convention, power/knowledge, time/eternity, theory/practice, and science/mysticism. Thinkers such as Homer, the pre-Socratics, Plato and Aristotle, the neo-Platonists, Augustine, and the Scholastics.

Prerequisite: Political Science 47.230 or permission of the Department.

Lectures three hours a week.

Political Science 47.335 ★

Canadian Political Ideas

The sources and development of political ideas in French and English Canada.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.336 ★

Canadian Political Culture

The elements of Canadian political culture: individual beliefs, attitudes and values, the influence of the economy and environment, ideology, political socialization, and regional differences.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.337 ★

Politics of Human Rights

Politics of human rights in its historical and cultural context, including: early liberal theories of natural rights; utilitarian and Marxist critiques; contemporary rights debates; different generations of rights; feminism and women's rights; cultural relativism; state sovereignty; and, problems of implementation and enforcement.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.341 ★

Canadian Public Administration

The Canadian bureaucracy as a major state actor in policy development. Selected issues and/or case studies in public sector management with particular attention paid to the process of policy identification through program development and implementation.

Precludes additional credit for Political Science 47.340.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.342 ★

Canadian Public Policy

Policy communities and policy networks in Canada with particular attention paid to policy issues, the political environment, policy instruments, impact and outcomes.

Precludes additional credit for Political Science 47.401.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.344 ★

Comparative Public Administration

Relations between the state bureaucracy or public organizations and civil society in various types of political and economic systems.

Consideration of themes relevant to developed and developing countries.

Precludes additional credit for Political Science 47.440 ★.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.345 ★

Comparative Public Policy Analysis

The formation and impact of public policy: a variety of political systems as well as a variety of policy areas. Emphasis on developing skills for the analysis of policy formation and impact.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.346 ★

Public Affairs and Media Strategies

The public affairs and issue management strategies of corporations, government departments, and other institutions in Canada from a comparative perspective.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.347 ★

Public Opinion and Public Policy

Consideration of Canadian and comparative quantitative data and literature relating to several areas of public opinion on key policy issues, including value systems and social inequality, work, health, the family, social welfare, national identity and the environment.

Prerequisite: Political Science 47.270 or permission of the Department.

Lectures three hours a week.

Political Science 47.350 ★

Women in Politics: Liberal Democracies I

The sex/gender dimension of political theory, culture, mass and elite participation, and public policy as manifested in selected liberal democracies, including Canada.

Precludes additional credit for Political Science 47.313 ★.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.351 ★

Women in Politics: Liberal Democracies II

A continued examination of the sex/gender dimension of political theory, culture, mass and elite participation, and public policy as manifested in selected liberal democracies, including Canada.

Precludes additional credit for Political Science 47.313 ★.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.352 ★

Women in Politics: Third World

The sex/gender dimensions of development theory and policy, political culture, mass and elite participation, and international agencies as manifested in selected Third World countries.

Precludes additional credit for Political Science 47.318 ★.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.360 ★

International Institutions

Origins, structure and functioning of international institutions with emphasis on the United Nations as well as regional organizations. Topics include peace and security, international aid and development, human rights and the control of global resources.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.361 ★

Theories of International Politics

Theoretical approaches to the study of international politics including an examination of the major concepts used for analysis

and explanation in the field.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.363 ★

Strategic Thought and International Security

The evolution of U.S., Soviet/Russian, and Chinese approaches to strategy and those of other regional powers, as well as the application of strategic thought to selected issues in international security.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.365 ★

Comparative Study of Foreign Policy

The utility of comparative analysis in the study of the objectives, strategies and decision-making processes involved in the foreign policies of states.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.366 ★

Canadian Foreign Policy

The traditions, domestic influences, objectives, capabilities, and decision-making processes, and analysis of selected contemporary issues.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.367 ★

Canadian Defence Policy

The evolution of Canadian defence policy in the twentieth century. The theory of Canadian defence policy and its operational aspects in a broad comparative context, related to themes such as strategic theory, military culture in a modern state, continentalism and military alliances.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.373 ★

Governing in the Global Economy

The main approaches and policy issues in the political economy of advanced industrialized states. The relationship between state and market and the ways in which national states have responded to the pressures of governing in an increasingly interdependent global economy.

Prerequisite: Third-year standing.

Lectures three hours a week.

Political Science 47.390

Études dirigées

Une programme de lectures choisies et de travaux écrits dans le domaine de spécialisation d'un membre du département. Consulter le conseiller des études de premier cycle (Undergraduate supervisor) pour les sujets offerts.

Prerequisite: Third-year standing in the Political Science "Mention: français" program.

Fourth Year: Honours and Graduate

These courses are normally reserved for Honours students in their Fourth year.

Political Science 47.400

Topics in Canadian Government and Politics

Section A: Political Economy of Canada. Selected issues in Canadian political economy including the role of the state in the Canadian economy, the political aspects of foreign ownership and economic structure and political change.

Section B: Canadian Political Institutions. Selected topics on institutions of Canadian Government at the federal level.

Section C: Canadian Political Behaviour. Voting, public opinion,

political violence, socialization and other aspects of political behaviour in Canada. Religion, class and region as determinants of political cleavage.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.402 ★

Policy Seminar: Problems of Northern Development

The issues, the policy processes and the problems of policy implementation in the political and economic development of Canada's northern territories.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.403 ★

Politics and the Media

The role of the mass media in the Canadian political system from a comparative perspective.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.405 ★

Stability, Justice and Federalism

Canada's unity crisis in a comparative perspective with particular attention to federalism, nationalism and regionalism.

Precludes additional credit for Political Science 47.405.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.406 ★

Legislative Process in Canada

The role of Parliament and of the individual M.P. in terms of policy making, representation and the passage of legislation.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.407 ★

The Politics of Law Enforcement in Canada

Major issues in the area of law enforcement policy, police administration and the criminal justice system in Canada. Particular emphasis on the role of law enforcement agencies as integral institutions of the Canadian political system.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.408 ★

National Security and Intelligence in the Modern State

The state's response to foreign espionage, alleged subversion, terrorism, and counterintelligence. Major focus on the Canadian experience, but with extensive use of materials chronicling the practices of KGB, CIA, BIS, ASIO, MOSSAD, etc.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.409 ★

Quebec Politics

Society, culture, economy and politics in Quebec. Special attention to the politically relevant changes since 1960 and the central place of Quebec within the Canadian federation.

Prerequisite: Fourth-year Honours standing and a reading knowledge of French.

Seminar three hours a week.

Political Science 47.410 ★

Canadian and Comparative Local Government and Politics

A comparative survey of the systems of local government in Canada, Britain and the United States. The emphasis on Canadian or comparative, and the problems chosen for study, vary with the interests of the students.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.411 ★

French-English Relations

French-English relations in federal politics and in selected provinces, with emphasis on areas of conflict and methods of conflict management.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Reading knowledge of French.

Seminar three hours a week.

Political Science 47.412 ★

Politics of Western Liberal Democracies

The social structure and politics of advanced capitalist societies, including the historical and contemporary relationship between social classes — groupings, political parties and interest groups.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.413 ★

The State in Advanced Capitalist Societies

Comparative analysis of the structure and role of the state in capitalist societies. Topics may include state economic intervention, corporatism, welfare state activities and neo-conservatism.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.414 ★

Theory and Practice in Third World Development

The various theoretical approaches to the analysis of development and underdevelopment, of the historical experience of important models of development and of their application to selected countries in Asia, Africa and Latin America.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.415 ★

Selected Problems in Third World Development

The nature of international factors that influence Third World development such as multinational corporations, the new international division of labour, the new protectionism, the role of international debt, the politics of the Green Revolution, technology, and development assistance.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.416 ★

Labour and the Canadian State

A comparative examination of models of labour and the liberal democratic state, with particular attention to the role of the Canadian labour movement in the political process.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.417 ★

Political Participation in Canada

The causes and implications of political participation by individuals with special reference to Canada. Topics include citizen participa-

tion in campaign and party organizations, political protest movements, interest groups, and community associations.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.418 ★

Canadian Provincial Government and Politics

The political processes and institutions of the provinces.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.419 ★

The Politics of the Canadian Charter of Rights and Freedoms

The genesis and impact of the Charter of Rights and Freedoms. Particular emphasis on the politics of aboriginal, language, and equality rights.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.420 ★

Policy Making in the United States

Conflict and co-operation in the United States legislative and executive/bureaucratic arenas; overlapping struggles over policy initiative, innovation and planning. Emphases determined by student needs and interests.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.421 ★

Politics of Influence in the United States

Parties, interest groups, coalitions, movements and other significant influences upon who gets what, when, how in the United States. Elections, democratic accountability and political uses of mass media. Emphases determined by student needs and interests.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.422 ★

Comparative Constitutional Politics

The political character of leading western constitutions, with special emphasis on judicial politics and judicial policy-making in the United States; consideration also given to developments in Canada, Britain and France.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.423 ★

Southern Africa After Apartheid

The pathology of apartheid, the reasons for its end, and prospects for democratization and development in southern Africa in the era of globalization. Also offered at the graduate level, with additional or different requirements, as Political Science 47.523, for which additional credit is precluded.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.424 ★

Elections

The conduct and meaning of elections in contemporary states. Attention to the connection of elections to concepts of representation, policy mandates, and political parties, and to electoral systems and referendums. Also offered at the graduate level, with addi-

tional or different requirements, as Political Science 47.524, for which additional credit is precluded.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.425 ★

Identity Politics

The strategies and ideologies of social movements in the Canadian political process, such as the women's movement and the environmental movement.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.426 ★

Indigenous Politics of North America

Issues of governance regarding the original peoples of Canada, Mexico and the United States since the European invasion. Contemporary movements for restoration of their cultural, political, socio-economic, land and self-governance rights, emphasizing both domestic and international strategies. Also offered at the graduate level, with additional or different requirements, as Political Science 47.510, for which additional credit is precluded.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.427 ★

Globalization, Adjustment and Democracy in Africa

This course will explore the nature of global pressures in Africa, as states go through a 'second wind' of political and economic change. Also offered at the graduate level, with additional or different requirements, as Political Science 47.517, for which additional credit is precluded.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.431 ★

Marxist Thought

An examination of Marxism with special emphasis on Marx and Engels, including writings from all periods of their work.

Prerequisite: Political Science 47.230 or permission of the Department.

Seminar three hours a week.

Political Science 47.432 ★

Contemporary Marxism

An examination of all relevant interpretations of Marx's theory including evolutionary socialism, Leninism, Trotskyism, Stalinism, Maoism and the main schools of contemporary revisionism.

Prerequisite: Political Science 47.431 ★.

Seminar three hours a week.

Political Science 47.434

Political Inquiry

Competing theoretical methods of inquiry in the discipline — positivism, functionalism, phenomenology, structuralism, and post-structuralism — with particular attention to the claims made for scientific truth. Weber, Polanyi, Feyerabend, Kuhn, Habermas, Foucault, Rorty and others.

Prerequisite: Political Science 47.230 or permission of the Department.

Seminar three hours a week.

Political Science 47.435

Contemporary Political Theory

Recent work in political theory, stressing major approaches to the understanding of contemporary political life. Approaches such as historicism, the sociology of knowledge, positivism, phenom-

enology, critical theory, existentialism, neo-classicism. Works by such thinkers as Gramsci, Mannheim, Popper, Strauss, Cassirer, Habermas, Sartre, and Voegelin.

Prerequisite: Political Science 47.230 or permission of the Department.

Seminar three hours a week.

Political Science 47.436 ★

Concepts of Political Community I

Concepts of political community, including the common good, justice, citizenship, statesmanship, democracy and legitimacy from ancient, modern and contemporary political theory. Also offered at the graduate level, with additional or different requirements, as Political Science 47.538, for which additional credit is precluded.

Precludes additional credit for Political Science 47.430 ★.

Prerequisite: Political Science 47.230 or permission of the Department.

Seminar three hours a week.

Political Science 47.437 ★

Concepts of Political Community II

A continued critical survey of concepts of political community, including the common good, justice, citizenship, statesmanship, democracy and legitimacy from ancient, modern and contemporary political theory. Also offered at the graduate level, with additional or different requirements, as Political Science 47.539, for which additional credit is precluded.

Precludes additional credit for Political Science 47.430 ★.

Prerequisite: Political Science 47.436 ★ or permission of the Department.

Seminar three hours a week.

Political Science 47.441 ★

Business-Government Relations in Canada

The theory and practice of business-government relations in Canada. Primary focus on the role of the private sector firm in the Canadian political system and policy process. Case studies addressing issues and problems in the relations of business to government.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.446 ★

Theories of Public Administration

Theories of bureaucracy, organization and comparison. Also offered at the graduate level, with additional or different requirements, as Political Science 47.646, for which additional credit is precluded.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.447 ★

Public Policy: Content and Creation

The content and creation of public policy. Focus on the explanation, prediction and design of policy. Perspectives and examples are drawn from a variety of frameworks and from both Canadian and non-Canadian contexts. Also offered at the graduate level, with additional or different requirements, as Political Science 47.647, for which additional credit is precluded.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.448

Public Organizations: Theory and Practice

The major schools of organizational theory and behaviour as approaches for understanding the nature of public organizations.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.449 ★

Issues in Development Management

An examination of the application of organization theory to policy implementation and evaluation for developing and transitional systems, with an emphasis on the role of cultural differences and divergent value systems in development management. (Also listed as International Affairs 46.422 ★)

Prerequisites: Economics 43.363 ★ and Fourth-year standing in the B.P.A.P.M. program and registration in either the International Studies specialization or the Development Studies specialization or permission of the Department.

Lectures or seminars three hours a week.

Political Science 47.450 ★

Feminist Political Analysis in Comparative Perspective

The gendered nature of authority, feminist reconceptions of representation and interests, the relationships between sex/gender regimes and state forms, and the strategic treatments of identity politics, race and class difference and nationalisms by various women's movements.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.455 ★

Transitions to Democracy

A comparative analysis of processes of democratization. Diverse theoretical approaches to understanding the timing, causes, nature, and limitations of democratization. Examples drawn from Europe and Russia, Latin America, Africa, and Asia.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.460

Analysis of International Politics

Principal issues in international relations; theory building, evaluation of concepts, research design, philosophy of science criteria and policy relevance in ongoing research in international relations theory.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.461 ★

Foreign Policies of Soviet Successor States

The foreign policies of the USSR and of Russian and selected other successor states, with special emphasis on the search for a new security order.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week

Political Science 47.463 ★

Analysis of International Political Economy

Various theoretical approaches to the study of the international political economy, with a focus on historical development and changing international structures.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.464 ★

Selected Problems in International Political Economy

Contemporary problems and issues in the international political economy, with particular attention given to advanced industrial countries.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.466 ★

American Foreign Policy

The sources, trends and conflicting interpretations of the international roles of the United States since World War II. Foreign policy machinery and processes assessed in terms of the relative importance of perceptions, ideology, self-interest, and domestic and foreign pressures.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.467 ★

International Politics of North America

A seminar examining the evolving relationship between Canada, the United States and Mexico, including political, economic, social, environmental and defence aspects. Also offered at the graduate level, with additional or different requirements, as Political Science 47.567, for which additional credit is precluded.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.471 ★

Intermediate Polimetrics for Micro Data

Research designs and statistical techniques primarily used in analyzing survey data. Selected topics may vary from year to year. Students doing Honours papers based on micro data are advised to take this course. Also offered at the graduate level, with additional or different requirements, as Political Science 47.571, for which additional credit is precluded.

Prerequisite: Political Science 47.270 or permission of the Department.

Seminar three hours a week.

Political Science 47.472 ★

Intermediate Polimetrics for Macro Data

Research designs and statistical techniques primarily used in analyzing macro or aggregate data. Selected topics may vary from year to year. Students doing Honours papers based on macro data are advised to take this course. Also offered at the graduate level, with additional or different requirements, as Political Science 47.572, for which additional credit is precluded.

Prerequisite: Political Science 47.270 or permission of the Department.

Seminar three hours a week.

Political Science 47.482 ★

International Politics of Africa

Focus on a particular theme related to the interactions of African states within the African subsystem and with other sectors in the international system.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.483 ★

Foreign Policies of Major East Asian Powers

The foreign policies of the East Asian powers, with special attention to China and Japan; an analysis of the domestic sources of policy, capabilities, interests, decision-making processes and foreign relations.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.484 ★

International Relations of South and Southeast Asia

Foreign policy orientations of the regional actors and interaction with non-regional actors. Special emphasis on enduring sources of conflict within the area, and emerging patterns of co-operation, including comparison of ASEAN with SAARC.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Political Science 47.490

Tutorial in a Selected Field

Tutorials or reading courses on selected topics in which seminars are not available arranged.

Prerequisite: Permission of the Department and agreement of an instructor.

Tutorial hours arranged.

Political Science 47.491 ★

Tutorial in a Selected Field

Tutorials or reading courses on selected topics in which seminars are not available arranged.

Prerequisite: Permission of the Department and agreement of an instructor.

Tutorial hours arranged.

Political Science 47.492 ★

Tutorial in a Selected Field

Tutorials or reading courses on selected topics in which seminars are not available arranged.

Prerequisite: Permission of the Department and agreement of an instructor.

Tutorial hours arranged.

Political Science 47.493 ★

British Parliamentary Politics

Parliament and the legislative process. Offered in London, U.K., by faculty members of Leeds University but governed by Carleton regulations and co-ordinated by Carleton's Department of Political Science.

Prerequisite: Selection to the Carleton-Leeds Parliamentary Internship Exchange.

Seminar three and one-half hours a week.

Political Science 47.494

Carleton-Leeds Parliamentary Internships (3.0 credits)

Parliamentary internships in Ottawa (Fall term) and London, U.K. (Winter term). The academic requirements are met through an essay and an oral examination. Graded *Sat* or *Uns*.

Prerequisite: Selection to the Carleton-Leeds Parliamentary Internship Exchange.

Internship four days a week.

Political Science 47.498

Honours Graduation Essay

The Honours essay is supervised under the direction of a faculty member who is either selected by the candidate or assigned early in the year. The Honours essay is evaluated by both the supervisor and an appointed reader. Students intending to proceed to post-graduate studies are strongly encouraged to complete an Honours essay.

Prerequisite: Fourth-year Honours standing in Political Science with a Political Science GPA or 9.0 or better*, or permission of the Supervisor of Undergraduate Studies.

Tutorial hours arranged.

Political Science 47.499

Mémoire de recherche

Un travail de recherche dans le domaine de spécialisation d'un membre du département. Consulter le conseiller des études de premier cycle (Undergraduate supervisor) pour les sujets offerts.

Prerequisite: Fourth-year standing in the Political Science "Mention: français" program.*

* Students should refer to regulations of the Faculty of Public Affairs and Management and the Faculty of Arts and Social Sciences regarding submission of Honours Essays and to the Department of Political Science course requirements for the Honours Essay, which may be obtained from the Departmental Office.

Graduate Courses

Fourth-year Honours students may, with permission of the Department, be admitted to the following 500-level Political Science seminars, which are more fully described in the *Graduate Studies and Research Calendar*:

Political Science

- 47.503 ★ Political Parties in Canada
- 47.506 ★ Politics in Canadian Government and Politics
- 47.507 ★ Topics in Canadian Politics and Government in Comparative Perspective
- 47.508 ★ The Politics of Energy and the Environment
- 47.509 ★ Canadian Political Economy
- 47.511 ★ Canadian Federalism
- 47.514 ★ The Transition from Communism
- 47.515 ★ Post-Communist Politics in East Central Europe
- 47.516 ★ Selected Problems in the Politics of Soviet Successor States
- 47.517 ★ Globalization, Adjustment and Democracy in Africa
- 47.518 ★ State, Revolution, and Reform
- 47.519 ★ Comparative Public Policy
- 47.520 ★ Nationalism
- 47.521 ★ Politics in Plural Societies
- 47.522 ★ Politics of Third World Development
- 47.525 ★ Problems in American Government I
- 47.526 ★ Problems in American Government II
- 47.531 ★ Modern Political Culture and Ideology
- 47.532 ★ Democratic Theories
- 47.536 ★ North American Political Traditions
- 47.537 ★ Political Thought in North America

- 47.541 ★ Canadian Public Administration and Policy Analysis
- 47.544 ★ Public Administration in Developed Western Countries
- 47.545 ★ Public Administration in Developing Countries
- 47.549 ★ Research Seminar in Public Administration
- 47.551 ★ Selected Issues in Political Economy I
- 47.552 ★ Selected Issues in Political Economy II
- 47.553 ★ Topics in West European Politics I
- 47.554 ★ Topics in West European Politics II
- 47.555 ★ Topics in Comparative Politics I
- 47.556 ★ Sex/Gender and Politics
- 47.561 ★ Analysis of Canadian Foreign Policy
- 47.573 ★ Advanced Research Methods
- 47.581 ★ Foreign Policies of African States
- 47.585 ★ Foreign Policy Analysis
- 47.586 ★ Strategic Thought and Issues in International Security
- 47.587 ★ Analysis of International Organizations
- 47.588 ★ International Political Economy
- 47.589 ★ Problems in International Politics

Related Courses

Subject to prior approval by the department, a student in the B.A. (Honours) or B.A. program may use one course in a related discipline as a political science credit. This permission will be granted only if the content of the transfer course is very closely related to political science and if the department of political science does not itself offer a comparable course. Students in the combined B.A. (Honours) programs may not use related courses as political science credits.

Psychology

(Arts and Social Sciences)

B550 Loeb Building
Telephone: 520-2644

Academic Administration

Chair, K. Matheson

Chair, Graduate Committee, J. LeFevre

Co-Chairs, Undergraduate Committee, R. Coplan, M. Sénéchal

Chair, Ethics Committee, M. Gick

Teaching Staff

Professor Emeritus
L. Strickland

Professors

Donald A. Andrews, B.A., M.A. (Carleton), Ph.D. (Queen's), C.Psych. • **Hymie Anisman**, B.A. (Sir George Williams), M.A. (Memorial), Ph.D. (Waterloo) • **R.F. Dillon**, A.B. (Dartmouth) M.S. (Florida), Ph.D. (Virginia) • **P.A. Fried**, B.Sc. (McGill), M.A., Ph.D. (Waterloo) • **Robert D. Hoge**, B.A. (Kenyon), M.A., Ph.D. (Delaware) • **William D. Jones**, B.A., Ph.D. (Sheffield) • **J.B. Kelly**, B.A. (Southwestern at Memphis), Ph.D. (Vanderbilt) • **Jo-Anne LeFevre**, B.Sc., M.Sc., Ph.D. (Alberta) • **Brian R. Little**, B.A. (Victoria), Ph.D. (California at Berkeley) • **Dan C. McIntyre**, B.S. (Carroll College, Wisconsin), M.A. (Northern Illinois), Ph.D. (Waterloo) • **Bruce A. Pappas**, B.A., M.A., Ph.D. (Queen's) • **William M. Petrusic**, B.A. (British Columbia), M.A., Ph.D. (Michigan) • **David C.S. Roberts**, B.Sc. (Victoria), M.Sc., Ph.D. (British Columbia) • **Warren B. Thorngate**, B.A. (California), M.A., Ph.D. (British Columbia) • **T.N. Tombaugh**, B.A. (DePauw), M.A., Ph.D. (Missouri), C. Psych. • **Jo Wood**, B.A. (DePauw), M.A., Ph.D. (Missouri) • **Robert M. Zacharko**, B.Sc. (Montréal), M.Sc., Ph.D. (Saskatchewan)

Associate Professors

Frances Cherry, B.A., M.A. (York), Ph.D. (Purdue) • **A. Forth**, B.A., M.A., Ph.D. (British Columbia) • **Mary L. Gick**, B.Sc. (McGill), Ph.D. (Michigan) • **Chris M. Herdman**, B.Sc. (Trent), M.Sc., Ph.D. (Alberta) • **Connie M. Kristiansen**, B.Sc. (Toronto), M.Sc. (London School of Economics), Ph.D. (Exeter) • **John Logan**, B.Sc. (Dalhousie), Ph.D. (Indiana) • **K. Matheson**, B.A., M.A. (Carleton), Ph.D. (Waterloo) • **Lise Paquet**, B.A., M.A. (Moncton), Ph.D. (Waterloo) • **Shelley E. Parlow**, B.Sc. (Victoria), M.A., Ph.D. (Toronto) • **Monique Sénéchal**, B.Ps., M.A. (Moncton), Ph.D. (Alberta) • **Brian W. Tansley**, B.A., M.A. (British Columbia), M.A., Ph.D. (Rochester), C.Psych. • **Roger B. Wells**, B.A. (Reed), M.A., Ph.D. (North Carolina), C.Psych. • **S.H. Wu**, M.D. (Shanghai Medical)

Assistant Professors

Robert J. Coplan, B.Sc. (McGill), M.A., Ph.D. (Waterloo) • **Tina Daniels**, B.A. (Queen's), M.A.Sc., Ph.D. (Waterloo) • **Timothy A. Pynchl**, B.Sc. (McMaster), B.Ed. (Ottawa), M.A., Ph.D. (Carleton)

Adjunct Research Professors

P.R. Ballantine, BNR • **D.J. Baxter**, Queen's University • **J. Bonta**, Solicitor General of Canada • **S. Borys** • **R. Broughton**, Ottawa General Hospital • **R. Brown**, Department of Psychology, Dalhousie University • **K. Busby** • **M. Cappelli**, Children's Hospital of Eastern Ontario • **E.J. Casson**, University of Ottawa Eye Institute • **A. Croll** • **J. D'Eon**, Regional Rehabilitation Centre • **B. Evans**, Canadian Heritage • **M.B. Ferlan**, Department of Psychology, Saint-Vincent Pavilion • **R.L. Franche**, Ottawa General Hospital • **B.A. Grant** • **R.K. Hansen**, Solicitor General of Canada • **D. Harper**, Saint Vincent Hospital • **B. Hu**, Ottawa Civic Hospital • **V. Knott**, Royal Ottawa Hospital • **S.M. Kuehn** • **W. Loza**, Kingston Penitentiary • **I. Manion** • **S.F. Mikail**, Regional Rehabilitation Centre • **E. Mohr**, Elisabeth Bruyere Hospital • **J. Olds**, Children's Hospital of Eastern Ontario • **R.T. Pivik**, University of Ottawa • **A.V. Ravindran**, Royal Ottawa Hospital • **L.P. Renaud**, Ottawa Civic Hospital • **K.E. Renner**, Carleton University • **D. Robinson**, Correctional Services Canada • **I. Shields**, Correctional Services Canada • **L. Stelmach**, Communications Research Centre • **A. Tellier**, Ottawa General Hospital • **J. Veitch**, National Research Council Canada • **J. Weekes**, Correctional Services Canada • **T. Whalen**, Communications Research Centre • **J.S. Wormith**, Solicitor General Ontario

Adjunct Professors

D.K. Bernhardt • **J. Partington**

Study in Psychology

The Department of Psychology offers two programs in the Faculty of Arts and Social Sciences. One leads to a B.A. (Honours) degree in Psychology; the other leads to a B.A. degree in Psychology. In the Faculty of Science, the Department offers a program leading to a Bachelor of Science (B.Sc.) degree (Honours) in Psychology and a B.Sc. (Honours) in Neuroscience.

With certain restrictions, the B.A. (Honours) degree programs may be combined with programs in other departments. In addition, the Department offers a Minor in Psychology.

To be eligible to enter, to continue and to graduate from these degree programs, students must fulfill all the University regula-

tions (see p. 48) and all appropriate Faculty regulations (see p. 74 for B.A. regulations, and p. 109 for B.Sc. regulations). In addition, students must meet the requirements of the Department of Psychology, as described below.

Course Organization in Psychology

Study in Psychology begins with 100-level Psychology courses, 49.101★ and 49.102★ (or 49.100), which are prerequisites for all other courses offered by the Department. At the 200-level, the Department offers core courses, which are frequently prerequisites for higher level courses. Some combination of these core courses is required in each of the programs of study offered by the Department of Psychology.

Included among the 200-level courses is Psychology 49.200, Introduction to Psychological Research and Statistics, which must be completed by all students enrolled in a Departmental program.

The 200-level courses lead to branching courses, which offer still further specialization in the subject matter of psychology. These and other advanced courses are numbered at the 300- and 400-level. The upper-level courses in psychology are loosely clustered into speciality areas, which may be used to focus study within degree programs. The speciality areas are identified by the next-to-last digit of the course number: Social Psychology (49.x1x), Neuroscience (49.x2x), History (49.x3x), Community (49.x4x), Developmental (49.x5x), Personality (49.x6x), Learning and Cognition (49.x7x), Testing and Assessment (49.x8x).

Courses Outside the Department of Psychology

Credits for the degree that are not specified by the Department of Psychology may be taken in any discipline, subject to the Faculty regulations beginning on p. 70. Unspecified credits may also be taken in Psychology so long as the maximum number of Psychology credits permitted for the degree is not exceeded.

Students are strongly urged to discuss the suitability of their course selections with the Undergraduate Office of the Department of Psychology.

Calculation of the Psychology GPA

The GPA in Psychology is based on all credits in psychology successfully completed, graded and counted in the degree program for which the student is registered. All such psychology credits to the maximum number permitted in the student's degree program are used in the calculation. Both the minimum number of required credits and the maximum number of psychology credits permitted in a Psychology degree program are given in the program description that follow. Psychology credits beyond the maximum number permitted in a Psychology degree program are not included in the calculation of the GPA and are excluded from the total number of credits counted toward the degree.

The minimum GPA in Psychology required to enter, continue and to graduate in a Psychology degree program are those stated in the Faculty regulations.

Mention: français

Students other than those in the B.Sc. (Honours) in Neuroscience program who wish to qualify for the "Mention: français" notation in Psychology may do so. To qualify, students must undergo placement testing by the Department of French in order to satisfy the language requirement and to protect the integrity of the initiative.

To graduate with the notation "Mention: français" students must include in their program the following:

Year 1

1.0 credit in the advanced study of the French language. This credit will be one of 20.145, 20.160, 20.169, 20.245, 20.260, 20.269 or 20.360. This credit will fulfill Requirement 12 of the B.A. (Honours) in Psychology program, Requirement 8 of the B.A. in Psychology program and Requirement 4 in the B.Sc. (Honours) in Psychology program.

Years 2 and 3

1.0 credit at the 200- or 300-level offered entirely in French and approved by the Department of Psychology. This credit will fulfill 1.0 credit of Requirement 10 of the B.A. Psychology program and Requirement 13 of both the B.A. and B.Sc. (Honours) in Psychology programs.

1.0 credit at the 200- or 300-level in Psychology taken entirely in French to satisfy one of the elective requirements in the relevant Psychology degree program. This credit must be approved by the Department of Psychology and must be taken at the University of Ottawa under the Exchange Agreement or at a francophone institution on a Letter of Permission obtained from the Registrarial Services office.

Year 4 (Honours)

1.0 credit at the 400-level in Psychology taken entirely in French at Carleton University. Normally this will be 49.490 ★ and 49.492 ★ or one of 49.495, 49.497 or 49.498.

To obtain the notation, students in a B.A. degree program with combined majors must fulfill the requirements for Mention français of both Departments. The Mention: français option is not available in combined degree programs in which the other Department does not offer the notation.

B.A. Programs in Psychology

B.A. (Honours) Program

The B.A. (Honours) program requires 20.0 credits, with a minimum of 9.0 and a maximum of 12.0 of these taken in Psychology. This program normally takes four years to complete, but may take longer.

In the Third year either a thesis or an essay option becomes available in the B.A. (Honours) in Psychology degree program. The thesis option provides increased training in both research methodology and writing and is intended primarily for students who plan post-graduate study and/or a career in research. The essay option offers training in writing and develops skills in literature review and is intended primarily for students who want to obtain this preparation and to take advantage of other opportunities that an Honours degree in Psychology can provide.

The thesis option requires an Honours seminar, which is normally taken in Third year and is usually followed in Fourth year by Psychology 49.498, Thesis for B.A. (Honours) in Psychology. The Department of Psychology offers seven Honours seminars (Psychology 49.310, 49.320, 49.340, 49.350, 49.360, 49.370 and 49.380). Each is scheduled for six hours a week. To enter an Honours seminar a student must have a GPA of 8.0 or better in all graded Psychology courses taken at Carleton. The prerequisites for the thesis course, Psychology 49.498, include a required minimum GPA in all graded Psychology courses taken at Carleton of 9.0.

The essay option requires Psychology 49.495 normally taken in the Fourth year.

The minimum required GPA required to enter Third year is 6.0 in all graded Psychology courses taken at Carleton. The minimum GPA required to enter Fourth year is 6.5 in all graded Psychology courses taken at Carleton. A requirement of both options is Psychology 49.300, Design and Analysis in Psychological Research (or an acceptable alternate). Students in an approved program which combines study in Psychology and another discipline may take approved alternate courses for Psychology 49.300, 49.495 or 49.498.

Students in part-time study should note that the times when Honours courses are offered may require enrolment during the Day division.

To enter the B.A. (Honours) program in Psychology, a student must make application at the Registrarial Services office of the Faculty of Arts and Social Sciences. Normally this is done before the start of the Second program year. The periods during the academic year when application may be made are announced by the Registrarial Services office. At the time of application a student should also consult the Undergraduate office about specific program requirements. Students who apply to change a program after

the start of the Second program year may have difficulty in completing the program in the usual time period.

Failure to maintain the minimum required GPA will result in a student being required to withdraw from the Honours program in Psychology. In addition, to enter and to continue in the B.A. (Honours) program, a student must meet the Faculty regulations. (See p. 70.)

Graduation from the B.A. (Honours) program in Psychology requires a GPA of 6.5 or better over all graded Psychology courses counted towards the degree.

A student in the B.A. (Honours) program may apply to transfer to the B.A. program at the times specified by the Registrarial Services office and may be graduated with a B.A. degree provided that the requirements for that degree have been satisfied.

The Department's requirements for the degree are summarized in the following list:

1. Psychology 49.101 ★ and 49.102 ★
2. Psychology 49.200
3. 1.0 credit from Psychology 49.220 ★, 49.250 ★ and 49.270 ★
4. 1.0 credit from Psychology 49.210 ★, 49.240 ★, 49.230 ★ and 49.260 ★
5. Psychology 49.300
6. One of Psychology 49.310, 49.320, 49.340, 49.350, 49.360, 49.370, 49.380.
7. 1.0 elective credit in Psychology at 300-level or higher
8. 1.0 elective credit in Psychology
9. Psychology 49.495 or 49.498
10. 2.0 credits from Biology, Chemistry, Computer Science, Geology, Mathematics and Physics
11. 2.0 credits from a discipline other than Psychology in the Faculty of Arts and Social Sciences
12. 3.0 optional credits above 100-level, not in Psychology
13. 1.0 optional credit, not in Psychology
14. 3.0 optional credits

In this program, the maximum number of Psychology credits permitted is 12.0.

B.A. with Combined Honours in Psychology and Another Discipline

When application is made to enter an Honours program in Psychology and another discipline, the student must declare one or the other as the discipline of primary study. This declaration is determined by the order in which the two disciplines are listed on the application. The other discipline must be selected from the Faculty of Public Affairs and Management or the Faculty of Arts and Social Sciences.

Application to enter a combined B.A. (Honours) program must be made at the Registrarial Services office appropriate to the discipline of primary study. Normally application is made before the start of the Second program year. The periods during the academic year when application may be made are announced by the Registrarial Services office. Students who apply to change a program after the start of the Second program year may have difficulty in completing the program in the usual time period.

The Department's requirements for the B.A. (Honours) in Psychology are modified when study is combined with another discipline. The Undergraduate office of the Department of Psychology should be consulted for advice in the selection of courses.

When Psychology is the discipline of primary study, Psychology 49.200, 49.300 and Psychology 49.498 or 49.495 are normally taken to meet Requirements 2, 5, and 9. When the other discipline is the one for primary study Requirements 2 and 5 may be met with approved alternatives in the other discipline, if available. Thus Psychology 49.200 (Requirement 2) may be replaced with Anthropology 54.203, Mass Communication 27.201, Political Science 47.270 or Sociology 53.203. Psychology 49.300 (Requirement 5) may be replaced with Economics 43.220, both Mass Communication 27.400 ★ and 27.402 ★ or Sociology 53.370.

The Honours thesis or essay (Requirement 9) must be completed in the discipline of primary study. If an Honours thesis or essay is not available in the other discipline, either Psychology 49.495 or 49.498 must be taken.

Acceptable alternatives to Psychology 49.495 and 49.498 in combined programs include Anthropology 54.495, Art History 11.499, Biology 61.497, Biology 61.498, Economics 43.498, English 18.498, Film Studies 19.495, Geography 45.491 ★ and 45.492 ★, Geography 45.499, German 22.499, History 24.499, Mass Communication 27.497, Music 30.498, Political Science 47.495, Religion 34.499, Russian 36.499, Sociology 53.495, East European Studies 55.498, Women's Studies 09.498.

Requirements 7 and 8 are waived.

A minimum of 7.0 credits in Psychology must be taken in the B.A. (Honours) program in Psychology and another discipline. Additional credits in Psychology must be taken to replace those credits for which approved alternatives for 49.200, 49.300, 49.495 or 49.498 are taken. The maximum number of Psychology credits allowed in any B.A. (Honours) program is 12.0.

Credit can not be obtained in a Psychology degree program for both a Psychology credit and an alternative credit in another discipline. Approved alternative credits are not used in the calculation of the GPA in Psychology.

B.A. Program

The B.A. program is intended for those students who want to have Psychology as their required area of study. The B.A. degree requires a total of 15.0 credits and normally takes three years of study. A minimum of 6.0 and a maximum of 8.0 of the credits must be in Psychology.

To enter the B.A. program in Psychology, a student must make application at the Registrarial Services office of the Faculty of Arts and Social Sciences. Normally this is done before the start of the Second program year. The periods during the academic year when application may be made are announced by the Faculty Registrarial Services office. At the time of application a student should also consult the Undergraduate office about specific program requirements. Students who apply to change a program after the start of the Second program year may have difficulty in completing the program in the usual time period.

The requirements for the degree may be met in part-time study.

Entry to and continuation in the B.A. program in Psychology as well as graduation with the B.A. degree require that the student maintain a GPA of at least 4.0 over all Psychology courses taken at Carleton University.

The student must meet all the relevant University and Faculty regulations. The University regulations begin on p. 48, and those of the Faculty on p. 74.

The Department's requirements for the degree are summarized in the following list:

1. Psychology 49.101 ★ and 49.102 ★
2. Psychology 49.200
3. 1.0 credits from Psychology 49.220 ★, 49.250 ★ and 49.270 ★

Psychology

4. 1.0 credits from Psychology 49.210 ★, 49.240 ★, 49.230 ★ and 49.260 ★
5. 1.0 elective credit in Psychology at 300-level or higher
6. 1.0 elective credit in Psychology
7. 2.0 credits from a discipline other than Psychology in the Faculty of Arts and Social Sciences
8. 3.0 optional credits above 100-level, not in Psychology
9. 3.0 optional credits, not in Psychology
10. 1.0 optional credit

In this program the maximum number of Psychology credits permitted is 8.0.

B.Sc. Programs in Psychology

B.Sc. (Honours) Program

First Year

1. Psychology 49.101 ★ and 49.102 ★ as an arts and social science elective.
2. Mathematics 69.107 ★ and 69.117 ★.
3. 2.0 credits from Biology 61.103 ★ and 61.104 ★, Chemistry 65.100, Geography 45.105 or Geology 67.100 or 67.105, Physics 75.101 ★ and 75.102 ★ or 75.105.
4. 1.0 additional credit from science, arts or social science

Second Year

1. Psychology 49.200.
2. 1.0 credit from Psychology 49.220 ★, 49.250 ★ and 49.270 ★.
3. Mathematics 69.257 ★ and 69.259 ★ or 69.217 ★ and 69.257 ★. (Psychology 49.300 may be substituted in Third year, in which case the student must offer 1.0 credit above first-year level in Biology, Mathematics, Chemistry or Physics chosen with approval of the Department of Psychology).
4. 1.0 credit from arts or social science other than Psychology.
5. 1.0 optional credit.

Third Year

(See Requirement 3, Second year)

1. One of Psychology 49.320, 49.350, 49.370, or 49.380.
2. One of Psychology 49.220 ★, 49.250 ★, or 49.270 ★, not previously taken and 49.230 ★.
3. 1.0 elective credit in Psychology.
4. 1.0 credit in arts or social science other than Psychology.
5. 1.0 Science Continuation Credit (not Psychology).

Fourth Year

1. Psychology 49.497.
2. 1.0 credit in Psychology chosen from the following Science Continuation courses: Psychology ★, 49.322 ★, 49.323 ★, 49.324 ★, 49.325 ★, 49.327 ★, 49.356 ★, 49.372 ★, 49.401 ★, 49.427 ★
3. 1.0 elective credit in Psychology.
4. 1.0 credit above First-year level in Biology, Chemistry, Geology, Mathematics or Physics.
5. 1.0 optional credit.

B.Sc. (Honours) in Neuroscience

Year 1

1. Psychology 49.101 ★ and 49.102 ★ as an arts and social science elective
2. Math 69.107 ★ and 69.117 ★

3. Biology 61.103 ★ and 61.104 ★

4. Chemistry 65.100

5. Physics 75.101 ★ and 75.102 ★ or 75.107 ★ and 75.108 ★
- Year 2

1. Psychology 49.200

2. Psychology 49.220 ★ and 49.270 ★

3. Biology 61.201 ★ and 61.220 ★

4. 1.0 arts or social science credit other than Psychology

5. Chemistry 65.223 ★ and 65.224 ★

Year 3

1. Mathematics 69.257 ★ and 69.258 ★ or Psychology 49.300

2. One of Psychology 49.320 or 49.370

3. 1.0 credit in Psychology from the Science Continuation courses: Psychology 49.322 ★, 49.323 ★, 49.324 ★, 49.325 ★, 49.327 ★, 49.356 ★, 49.372 ★, 49.401 ★, 49.427 ★

4. Biology 61.335 ★ and 61.214 ★

5. 1.0 elective credit in Biology or Biochemistry

Year 4

1. Psychology 49.497 or Biology 61.498 – Thesis in neurophysiology, animal behavior, neuropsychology or related topic

2. 1.0 credit in Psychology chosen from the following Science Continuation courses: Psychology 49.322 ★, 49.323 ★, 49.324 ★, 49.325 ★, 49.327 ★, 49.356 ★, 49.372 ★, 49.401 ★, 49.427 ★

3. Biology 61.435 or equivalent

4. 1.0 advanced credit in Biology

5. 1.0 optional credit (unless Biology 61.103 ★ and 61.104 ★ is offered in lieu of OAC in Biology)

Minor in Psychology

Students registered in programs other than Psychology may register for the Minor in Psychology through their Registrarial Services office.

A minor in Psychology will consist of 4.0 credits in Psychology. Required courses include: Psychology 49.101 ★, 49.102 ★, 49.200, plus 2.0 additional credits at the 200-level or above.

Requirement for Breadth, for students in B.A. or B.A.(Honours) degrees

Category for Breadth	Courses in this unit
The temporal dimension of human societies, analyzing times before the present era or societies other than our own	
The artifacts of the imagination in literature and/or other forms, or that addresses the life of the imagination and culture.	
The understanding of social, technological and/or natural processes and the ways in which that understanding is obtained in science and social science.	All Courses in Psychology
Matters of human values, ethics and social responsibilities	

Departmental Advice

The Department of Psychology maintains an Undergraduate Office, which operates daily from Monday to Friday. There students will find advice about Psychology programs, course selections and program changes. Faculty and staff are available for discussion of career options and courses of study. The office is located in B552 Loeb Building, and may be reached by telephone at 613-520-2643.

Graduate Program

The Department of Psychology offers studies leading to the degree of Master of Arts (M.A.) and to the Doctor of Philosophy (Ph.D.) degree. For details of these programs consult the Department and the Calendar of the Faculty of Graduate Studies and Research.

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

First-Year Seminar in Psychology 01.136

Diversity in Psychological World Views

Theories, research and applications of psychology from the perspective of different cultures and sub-cultures. The validity of psychology across society; how it defines and changes people, and how it reflects and engineers particular social values and norms. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar in Psychology 01.137

Psychology and Criminal Justice

Theories, research, and practical applications of psychology to the criminal justice system. Topics may include eyewitness testimony, prediction of violence, classification and rehabilitation of offenders, victim studies, and judicial decision making. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar in Psychology 01.138

Motivating Humans

The psychology of human motivation. Everyday concepts such as laziness in relation to diverse theories and explanations of motivation such as drive-reduction, sociobiology, personal goals, self-actualization and spiritual awareness. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar in Psychology 01.139

Parents and Parenting Theories, Concepts and Applications from Developmental Psychology

Parents and parenting from infancy to adolescence. Potential topics include: establishing a relationship with your child, child discipline, historical perspectives, child care issues, and the impact of marital conflict and divorce. Applied issues relevant to parents and "future" parents. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar in Psychology 01.140

Cognition: A Scientific Exploration of the Mind

Theories, research, and applications of Cognitive Psychology. Research projects will familiarize students with the scientific method

used to study pattern recognition, attention, memory, language and thinking. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

Psychology 49.101 ★

Introduction to Psychology I

A survey of topics associated with psychology's role as a natural science, including neuroscience, cognition, and learning.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Lecture three hours a week.

Psychology 49.102 ★

Introduction to Psychology II

A survey of topics associated with psychology's role as a social science, including social psychology, personality and abnormal psychology.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Lecture three hours a week.

Note: 49.100 has been replaced with 49.101 ★ and 49.102 ★. Prerequisites for all courses beyond the 100-level in Psychology include both 49.101 ★ and 49.102 ★

Psychology 49.200

Introduction to Psychological Research and Statistics

Various research methodologies and statistical ideas employed within contemporary psychology. Topics covered include experimental and observational techniques as well as basic data analysis using descriptive and inferential statistics.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Lectures three hours a week.

Psychology 49.210 ★

Introduction to Social Psychology

Introduction to contemporary theory and research in social psychology. Areas covered include attitude structure and change, small groups and social learning.

Note: Students who wish to substitute Sociology 53.210 for Psychology 49.210 ★ should consult the Undergraduate Office of the Department of Psychology. Students may not offer both Sociology 53.210 and Psychology 49.210 ★ for credit.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Lectures three hours a week.

Psychology 49.220 ★

Biological Foundations of Behaviour

A general introduction to the biological basis of behaviour with particular reference to biological mechanisms associated with sensory and perceptual processes, motivation, emotion, learning and cognition.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Lectures three hours a week.

Psychology 49.230 ★

Origins of Modern Psychology

The evolution of psychology in Europe and North America is surveyed with an emphasis on psychology as a specialized area of knowledge and practice in the nineteenth and twentieth centuries.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Lectures three hours a week.

Psychology 49.240 ★

Introduction to Forensic Psychology

Forensic psychology, including a critical review of theories, methods, and research findings. Topics covered may include development of offending, eyewitness testimony, victim studies, risk as-

assessment, offender rehabilitation, offender classification, and police studies.

Prerequisite: Psychology 49.101 ★ and 49.102 ★, or 49.100.

Lectures three hours a week.

Psychology 49.250 ★

Foundations of Developmental Psychology

Basic principles of developmental psychology with a concentration on theories and methods. Emphasis is on the psychology of childhood and adolescence.

Prerequisite: Psychology 49.101 ★ and 49.102 ★, or 49.100.

Lectures three hours a week

Psychology 49.260 ★

Introduction to the Study of Personality

An introduction to the study of personality. Consideration of problems, methods and theories.

Prerequisite: Psychology 49.101 ★ and 49.102 ★, or 49.100.

Lectures three hours a week.

Psychology 49.270 ★

Introduction to Cognitive Psychology

A general introduction to cognitive processes, including a survey of theories, issues, methods and findings. Topics covered may include pattern recognition, attention, imagery, learning (animal and human), memory, language, and thinking.

Prerequisite: Psychology 49.101 ★ and 49.102 ★, or 49.100.

Lectures three hours a week.

Psychology 49.300

Design and Analysis in Psychological Research

Techniques in data analysis, probability theory, sampling distribution theory and the ideas and procedures of estimation, classical and Bayesian approaches to hypothesis testing, linear regression and curve fitting, distribution free hypothesis testing, and the analysis of variance methods in experimental design. Limited enrolment.

Precludes additional credit for Economics 43.220, Mass Communication 27.400 ★ and 27.402 ★, or Sociology 53.370.

Prerequisites: Psychology 49.200 and permission of the Department. Intended for Honours students in Psychology.

Lectures and tutorial four hours a week.

Psychology 49.310

Social Psychology (Honours Seminar)

An analysis of historical and contemporary developments in social psychology theory, research and methodology. Students may be required to complete independent research projects.

Prerequisites: Psychology 49.200 and 49.210 ★. A GPA of 8.0 or better in all graded Carleton Psychology courses is normally required. Permission of the Department required; limited enrolment; intended for Honours students.

Lectures, seminars and tutorials six hours a week.

Psychology 49.311 ★

Social Problems

An analysis of one or more social problems from the point of view of social psychology. The problems studied vary from year to year and may include war and peace, prejudice and discrimination, gender roles, politics and social change, leisure and quality of working life.

Prerequisite: Psychology 49.210 ★.

Lectures and seminars three hours a week.

Psychology 49.312 ★

Cognitive Processes in Social Psychology

In-depth coverage of one or more sub-areas of social psychology introduced in Psychology 49.210 ★. Topics may include attitudes, impression formation, attribution of social causality, decision making, and social judgment.

Prerequisite: Psychology 49.210 ★.

Lectures and seminars three hours a week.

Psychology 49.313 ★

Group Processes in Social Psychology

In-depth coverage of one or more sub-areas of social psychology introduced in Psychology 49.210 ★. Topics may include interaction in the dyad, coalition formation in larger groups, history and theory of small group research, North American, West-European and East-European models of group behaviour, and training groups in industry. (Also listed as Social Work 52.313 ★)

Prerequisite: Psychology 49.210 ★ or permission of the Department.

Lectures and seminars three hours a week.

Psychology 49.320

Behavioural Neuroscience (Honours Seminar)

A detailed consideration of biological approaches to the study of behaviour and of research methods used in behavioural neuroscience.

Prerequisites: Psychology 49.200 (or 49.200 ★) and 49.220 ★. A GPA of 8.0 or better in all graded Carleton Psychology courses is normally required. Permission of the Department required; limited enrolment; intended for Honours students.

Lectures, seminars and laboratory tutorials six hours a week.

Psychology 49.322 ★

Sensory Processes

The physiological basis of sensation. Topics include sensory mechanisms, neuropsychological bases of perception and psychological phenomena encountered in the various senses.

Prerequisite: Psychology 49.220 ★.

Lectures and seminars three hours a week.

Psychology 49.323 ★

Field Course in Animal Behaviour

Offered in the Department of Biology as Biology 61.365 ★. Only those modules dealing with animal behaviour topics may be offered for Psychology credit.

Prerequisite: Permission of the Department.

Psychology 49.324 ★

Drugs and Behaviour

An introduction to synaptic mechanisms and the arrangements of the transmitter-specific brain systems, followed by a discussion of neuro-pharmacological bases of normal and abnormal behaviour and of the behavioural effects of various classes of psychoactive drugs such as stimulants, tranquilizers, opiates, etc.

Prerequisite: Psychology 49.220 ★.

Lectures and seminars three hours a week.

Psychology 49.325 ★

Psychopharmacology and Behavioural Medicine

An examination of the relationship between endogenous neurochemical, hormonal and immunological states and various physiological and behavioural pathologies. The contribution of psychological variables to these pathologies will be assessed.

Prerequisite: Psychology 49.324 ★ or permission of the Department.

Lectures and seminars three hours a week.

Psychology 49.327 ★

Human Neuropsychology

Human experimental neuropsychology with emphasis on the basic principles and methods used to study brain-behaviour relationships in normal and brain-damaged subjects. Topics include the development and structure of the human nervous system and the principles of neurology.

Prerequisite: Psychology 49.220 ★.

Lectures three hours a week.

Psychology 49.340

Applied Psychology and Program Evaluation (Honours Seminar)

Theoretical and empirical approaches to research and study in an

area of applied psychology. Major methodological issues in program evaluation. Areas and programs covered may change from year to year and have included forensic and community psychology. Limited enrolment.

Prerequisites: Psychology 49.200 and either Psychology 49.210 ★ or 49.260 ★ and permission of the Department. A GPA of 8.0 or better in all graded Carleton Psychology courses is normally required. Intended for Honours students.

Lectures, seminars and tutorials, six hours a week.

Psychology 49.342 ★

Criminal Behaviour

An examination of behavioural approaches to the classification and treatment of offenders. Theories and research relevant to selected patterns of law-breaking and selected offender types are reviewed. The value of behaviour modification and counselling programs within prisons is examined.

Prerequisite: Psychology 49.210 ★ or 49.240 ★ or 49.260 ★.

Lectures and seminars three hours a week.

Psychology 49.343 ★

Addiction

A critical review of theories and research on the acquisition and maintenance of addictive behaviour. The rationale and outcome of treatment programs for the abuse of alcohol, tobacco, the opiates and the amphetamines.

Prerequisites: 2.0 credits in Psychology including Psychology 49.101 ★ and 49.102 ★, or 49.100.

Lectures three hours a week.

Psychology 49.345 ★

Psychology of Motivation and Emotion

Historical review of the concepts of motivation and emotion. Examination of such current concepts as anxiety, stress and depression, among the emotions, and obesity, sexual behaviour and the need to achieve, among the motivations.

Prerequisite: Psychology 49.101 ★ and 49.102 ★, or 49.100.

Lectures and seminars three hours a week.

Psychology 49.346 ★

Psychological Factors in Health and Illness

Topics covered include sociocultural influences on physical health, psychological factors in physical disease, behavioural diagnostic techniques, pain and its regulation, factors affecting compliance to therapy, and behavioural variables in the treatment and management of physical disorders.

Prerequisite: Psychology 49.101 ★ and 49.102 ★, or 49.100.

Lectures and seminars three hours a week.

Psychology 49.350

Developmental Psychology (Honours Seminar)

The major theoretical and empirical approaches within developmental psychology are examined through a detailed consideration of selected topics. Students may be required to complete independent research projects.

Prerequisites: Psychology 49.200, 49.250 ★. A GPA of 8.0 or better in all graded Carleton Psychology courses is normally required. Permission of the Department required. Limited enrolment, intended for Honours students.

Lectures, seminars and laboratory tutorials six hours a week.

Psychology 49.354 ★

Psychology of Adult Development and Aging

Development and change after the age of physical maturity.

Prerequisite: Psychology 49.250 ★.

Lectures three hours a week.

Psychology 49.355 ★

Exceptional Children

Selected topics concerning exceptional children such as mentally retarded, brain damaged, physically handicapped, disturbed and

gifted children.

Prerequisite: Psychology 49.250 ★.

Lectures and seminars three hours a week.

Psychology 49.356 ★

Cognitive Development

The development of human cognition is examined with a focus on memory, thinking and language through the life span. Topics that may be considered include perceptual and language development, emergent literacy, development of strategies and development of reading and arithmetic skills.

Note: No more than two of the following developmental branching courses may be credited toward the B.A. or B.Sc. degree: Psychology 49.354 ★, 49.356 ★ and 49.357 ★.

Prerequisites: Psychology 49.250 ★ and 49.270 ★.

Lectures three hours a week.

Psychology 49.357 ★

Social Development

The development of the individual is examined with a focus on social cognition and social behaviour. Topics that may be considered include the role of temperament in development, the role of parents, siblings and peers in social/emotional development, the development of prosocial and aggressive behaviour, moral development and the development of self and other understanding.

Note: No more than two of the following developmental branching courses may be credited toward the B.A. or B.Sc. degree: Psychology 49.354 ★, 49.356 ★ and 49.357 ★.

Prerequisite: Psychology 49.250 ★.

Lectures three hours a week.

Psychology 49.360

Personality (Honours Seminar)

Issues and research methodologies in the study of personality. Included may be a consideration of research on psychopathology and personality theory, and evaluation of psychotherapy/counselling process and outcome. Students may be required to complete independent research projects.

Prerequisites: Psychology 49.200, 49.260 ★. A GPA of 8.0 or better in all graded Carleton Psychology courses is normally required. Permission of the Department required. Limited enrolment, intended for Honours students.

Lectures, seminars and laboratory tutorials six hours a week.

Psychology 49.363 ★

Psychology of Women

An examination of the literature on the psychology of women. Topics to be considered include: theories of female personality development, sex differences in ability and personality, biological influences on female behaviour, female sexuality, sex roles, women's roles throughout the life span.

Prerequisite: Psychology 49.210 ★ or 49.250 ★ or 49.260 ★.

Lectures three hours a week.

Psychology 49.364 ★

Abnormal Psychology

History of the concept of behavioural abnormality. Theory and selected research dealing with the nature and etiology of behavioural abnormality.

Prerequisites: Psychology 49.260 ★ or 49.250 ★ or both Psychology 49.101 ★ and 49.102 ★, or 49.100, and Third-year standing.

Lectures three hours a week.

Psychology 49.366 ★

Issues in Personality

Topics selected from areas of interest in Personality. When offered, detailed topic descriptions are available from the departmental office prior to registration.

Prerequisites: Psychology 49.200 and 49.260 ★; or permission of the Department.

Lectures three hours a week.

Psychology 49.370

Cognition

Issues and research methodologies in the study of cognitive processes involved in perception, attention, language, reasoning, problem solving, decision making, human learning, and memory. The major theoretical issues and the empirical studies of human. Limited enrolment.

Prerequisites: Psychology 49.200, 49.270 ★ and permission of the Department. A GPA of 8.0 or better in all graded Carleton Psychology courses is normally required. Intended for Honours students.

Lectures, seminars, and laboratory tutorials six hours a week.

Psychology 49.372 ★

Perception

A consideration of data and theory concerning perceptual processes. Such topics as psychophysical methodology, perception of form and space and perceptual learning are discussed.

Prerequisites: Psychology 49.101 ★ and 49.102 ★, or 49.100, and one of Psychology 49.200 or Mathematics 69.107 ★ and 69.117 ★ (or equivalent).

Lectures three hours a week.

Psychology 49.380

Human Assessment (Honours Seminar)

A critical appraisal of assessment techniques used for research, classification, and clinical/counselling purposes. Topics may include reliability, validity, and utility of tests, individual difference measurement in general psychology, ethical issues in testing, and alternatives to orthodox assessment. Laboratory exercises expose the student to selected psychometric and assessment techniques.

Prerequisites: Psychology 49.200 and at least one of 49.210 ★, 49.250 ★, 49.260 ★. A GPA of 8.0 or better in all graded Carleton Psychology courses is normally required. Permission of the Department required. Limited enrolment, intended for Honours students.

Lectures, seminars, and laboratory tutorials six hours a week.

Psychology 49.391 ★

Practicum in Community Psychology

Through seven-hour-a-week field placements and regular class forums, students are provided with the opportunity to pursue personal learning objectives concerning the application of psychology within the community. Academic requirements are satisfied through a term paper, which integrates the experiential knowledge gained in the placement with theoretical and empirical knowledge gained from the literature review.

Note: Students registered in the Criminology and Criminal Justice concentration should enrol in Psychology 49.393 ★ and/or 49.394 ★.

Prerequisite: Open to Third- and Fourth-year students in Psychology with permission of the Department.

Psychology 49.392 ★

Practicum in Community Psychology

Through seven-hour-a-week field placements and regular class forums, students are provided with the opportunity to pursue personal learning objectives concerning the application of psychology within the community. Academic requirements are satisfied through a term paper, which integrates the experiential knowledge gained in the placement with theoretical and empirical knowledge gained from the literature review.

Note: Students registered in the Criminology and Criminal Justice concentration should enrol in Psychology 49.393 ★ and/or 49.394 ★.

Prerequisite: Open to Third- and Fourth-year students in Psychology with permission of the Department.

Psychology 49.401 ★

Special Topics in Psychology

The topics of this course, to be offered as demand warrants, vary from year to year and are announced well in advance of the period of registration. A list of this year's topics can be obtained from the Psychology Undergraduate office (B552 Loeb Building) after March 1.

Psychology 49.402 ★

Special Topics in Psychology

The topics of this course, to be offered as demand warrants, vary from year to year and are announced well in advance of the period of registration. A list of this year's topics can be obtained from the Psychology Undergraduate office (B552 Loeb Building) after March 1.

Psychology 49.403 ★

Special Topics in Psychology

The topics of this course, to be offered as demand warrants, vary from year to year and are announced well in advance of the period of registration. A list of this year's topics can be obtained from the Psychology Undergraduate office (B552 Loeb Building) after March 1.

Psychology 49.405 ★

Psychological Aspects of Product Design Methodology

Important issues in designing successful computerized products, including design guidelines, usability testing and user-needs analysis. Experienced designers and researchers from industry participate.

Prerequisites: Third-year standing and permission of the Department.

Lectures three hours a week.

Psychology 49.427 ★

Neuropsychology of Memory Disorders

Memory disorders that have a neuropsychological origin will be covered.

Prerequisite: Psychology 49.327 ★.

Lecture and seminar three hours a week.

Psychology 49.430 ★

History and Theory of Psychology: Selected Topics

Among topics that may be covered: the history of a particular time period, the history of a content area or issues related to theory in psychology.

Prerequisites: Third-year standing, and Psychology 49.230 ★ or permission of the Department.

Lectures and seminars three hours a week.

Psychology 49.473 ★

Cognition and Instruction

General theories of skill and knowledge acquisition as they relate to learning in specific subject matter areas, cognitive analyses of tasks and performances that are instructionally relevant, and cognitive-theoretical analyses of instructional interventions.

Prerequisites: Third-year standing, Psychology 49.200 and 49.270 ★, and permission of the Department.

Lectures three hours a week.

Psychology 49.490 ★

Independent Study

A reading or research course for selected students who wish to investigate a particular topic of interest. Available to Third- and Fourth-year students only. Normally students may not offer more than one credit of independent study in their total program.

Prerequisite: Permission of the Department.

Psychology 49.492 ★

Independent Study

A reading or research course for selected students who wish to investigate a particular topic of interest. Available to Third- and Fourth-year students only. Normally students may not offer more than one credit of independent study in their total program.

Prerequisite: Permission of the Department.

Psychology 49.495

Essay for B.A. (Honours) in Psychology

During the Fall term exercises to develop skills necessary to write and read critically, including time management, literature searches, writing styles, and computer-assisted document preparation. During the Winter term a substantial essay is prepared under the supervision and approval of the instructor.

Note: Re-registration for this course will not be permitted.

Precludes additional credit for Psychology 49.497, 49.498 and 49.499.

Prerequisites: Fourth-year standing in B.A. (Honours) in Psychology, 49.300, 1.0 additional credit in Psychology above the 200-level, and permission of the Department.

Lectures and discussion as scheduled by the Instructor.

Psychology 49.497

Thesis for B.Sc. with Honours in Psychology

Open to all candidates for the B.Sc. degree with Honours in Psychology. A thesis project is conducted under the direct supervision of a Faculty Adviser from the Department of Psychology. Faculty regulations concerning the Honours degree, including deadlines for submissions are found on p. 67.

Prerequisites: Fourth-year Honours standing in Psychology; Psychology 49.300 or Mathematics 69.257 ★ and 69.259 ★ or Mathematics 69.217 ★ and 69.257 ★; one of Psychology 49.320, 49.350, 49.370 or 49.380; and permission of the Department.

Lectures as scheduled by the Instructor; other hours as arranged with the Faculty Adviser.

Psychology 49.498

Thesis for B.A. with Honours in Psychology

Open to all candidates for the B.A. (Honours) in Psychology. A thesis project is conducted under the direct supervision of a Faculty Adviser from the Department of Psychology. Faculty regulations concerning the Honours thesis, including deadlines for submissions, are detailed on p. 67.

Precludes additional credit for Psychology 49.495, 49.497 and 49.499.

Prerequisites: Fourth-year Honours standing in Psychology, Psychology 49.300 or Mathematics 69.257 ★ and 69.259 ★ or Mathematics 69.217 ★ and 69.257 ★, one of Psychology 49.310, 49.320, 49.340, 49.350, 49.360, 49.370 or 49.380; and permission of the Department.

Lectures as scheduled by the Instructor; other hours as arranged with the Faculty Adviser. Lectures as scheduled by the Instructor; other hours as arranged with the Faculty Adviser.

Public Administration (Public Affairs and Management)

1022 Dunton Tower
Telephone: 520-2547

Academic Administration

Director, Frances Abele

Supervisor of Undergraduate Studies, Robin H. Farquhar

Teaching Staff

Professors

Manfred A. Bienefeld, B.A. (Toronto), Ph.D. (London School of Economics) • **G.B. Doern**, B.Com. (Manitoba), M.A. (Carleton), Ph.D. (Queen's) • **Robin H. Farquhar**, B.A., M.A. (British Columbia), Ph.D. (Chicago), F.C.C.E.A. • **Katherine A.H. Graham**, B.A. (York), M.A. (Queen's) • **N.H. Lithwick**, B.A. (Western Ontario), Ph.D. (Harvard) • **P. Rianne Mahon**, B.A. (York), M.A., Ph.D. (Toronto) • **Allan M. Maslove**, B.A. (Manitoba), Ph.D. (Minnesota) • **Leslie A. Pal**, B.A. (Mount Allison), M.A., Ph.D. (Queen's) • **Eugene Swimmer**, B.A. (City College of New York), M.A. (Chicago), Ph.D. (Cornell) • **Stanley Lewis Winer**, B.A. (Carleton), M.A., Ph.D. (Johns Hopkins)

Associate Professors

Frances D. Abele, B.A. (Calgary, Toronto), M.A., Ph.D. (York) • **Leigh Anderson**, B.A. (Calgary), M.A., Ph.D. (Washington) • **Calum M. Carmichael**, B.A. (Western Ontario), M.P.A., Ph.D. (Princeton) • **K. Newton**, M.A. (McMaster), Ph.D. (Simon Fraser) • **Susan D. Phillips**, B.A. (Victoria), M.A. (Waterloo), M.A., Ph.D. (Carleton) • **Philip Ryan**, B.A., M.A. (Toronto), Ph.D. (Carleton) • **Saul Schwartz**, B.Sc., Ph.D. (Wisconsin) • **Donald G. Swartz**, B.A., M.S., Ph.D. (Cornell) • **Glen Toner**, B.A. (Saskatchewan), M.A. (Alberta), Ph.D. (Carleton) • **George Warskett**, B.Sc. (London), M.Sc., Ph.D. (Queen's)

Assistant Professor

Denis Saint-Martin, B.Sc., M.Sc. (Montreal), Ph.D. (Carleton)

Adjunct Research Professors

M. Hicks • **M. Seasons** • **M. Abrams** • **S. Harris**

General Information

Public administration is the field of study concerned with the choice, design and implementation of government programs. It is analytical in the sense that it attempts to develop an understanding of why politicians and public servants act the way they do, and of what policies or practices are best able to achieve specified goals. It is practical in the sense that it considers actual policies or practices of government, and methods for their reform.

Public administration is also multi-disciplinary. It draws from other disciplines that have something to say about the opportunities and limitations governments face. Political science examines the political system of which the public service is a part, and the processes by which policy decisions are made. Economics considers the allocation of products and resources in markets with and without government involvement. Law addresses the legal control of public authorities and the rights of citizens. Sociology describes the behaviour and motivation of individuals working in bureaucratic settings. Accounting, quantitative methods, history, science, ethics — all can have a bearing on the field of public administration.

The School of Public Administration was established in 1953, and has the distinction of being the first of its kind in Canada. Students of public administration could wish for no better place to study than the national capital. Ottawa is home to many federal government departments and agencies, as well as national associations, research institutes and non-governmental organizations that deal with public policy issues. All are valuable sources of information for enquiring students. In addition, the federal government is a source of career-oriented summer and term employment.

The School offers two undergraduate programs in public administration. The Bachelor of Public Administration is an Honours program designed for students planning a career in the public service. Although a majority of the graduates have traditionally found employment in the public sector, many have professions in the

private sector, law, journalism and academia. The Certificate in Public Service Studies is designed for public servants without university training who would like to broaden their educational background through career-related part-time study. Credits taken under the Certificate can subsequently be applied toward a Bachelor of Arts or the Bachelor of Public Administration degree.

Bachelor of Public Administration

Graduation Regulations

In order to graduate, students must fulfill all University graduation regulations (see p. 48) and all Faculty regulations (see p. 74), in addition to all School regulations and requirements as set out below.

Admission Requirements

Same as for Faculty of Public Affairs and Management.

Entry into Second year is dependent on academic promise, with students being assured of admission who have completed First year with 5.0 credits, achieved a grade of B- or better in both Economics 43.100 and Political Science 47.100, and achieved a CI of 7.00.

Probation is not available in the Public Administration Honours program.

Requirements for continuation in Honours are found on p. 72.

With the advent of the Bachelor of Public Affairs and Policy Management program, in particular its Specialization in Public Policy and Administration (see p. 417), no new students are being admitted to First-year studies in the Bachelor of Public Administration program after 1998-99, to its second year after 1999-2000, to its third year after 2000-2001, or to its fourth year after 2001-2002.

Course Requirements

Candidates for the degree of Bachelor of Public Administration must satisfy all requirements for the B.A.(Honours). (See p. 74).

The Bachelor of Public Administration Program comprises 20.0 credits, of which 15.0 are made up by required courses. The School encourages students to take the required courses in the sequence outlined below, in order to avoid timetable conflicts. The School also encourages students to choose as options those courses that are prerequisites for the particular Management and Policy Electives they are considering.

The First year includes 2.0 credits made up by required courses. They introduce the major political ideas and institutions in Canada and other countries, and introduce the behaviour of consumers, producers and governments in individual markets and in the aggregate economy.

The Second and Third years include 8.0 credits made up by required courses that provide a broader background in political science and economics, and a basic knowledge of law, accounting and quantitative methods. The courses in political science emphasize the Canadian political system and the role of the public service within it. The courses in economics emphasize the taxing and spending powers of government. The law course addresses the legal context in which public authorities operate. The accounting and quantitative methods courses develop skills in the collection and interpretation of data useful to both private and public organizations. The Third year also includes a seminar in policy analysis that considers various theories of government decision making, with particular attention being paid to the integration of the insights offered by the various disciplines to which the students have already been introduced.

In Fourth year, students specialize. They select courses that reflect their own career or research interests from a wide selection of Management and Policy Electives. They also write an Honours Essay — an in-depth research paper written under the supervision of an individual faculty member. A topics seminar allows students to present their own research and to discuss that of others.

Full-time students in Fourth year with an Honours GPA of 9.0 or better and an overall GPA of 7.0 or better are eligible to apply to the co-op option. Students admitted to this option must satisfactorily complete at least one work term in order to graduate with a co-op designation on their transcripts and diploma. These work terms are four months in duration, and are at a junior officer level within the federal public service; they provide students with opportunities to integrate the academic and applied aspects of public administration. During a work term, students will register in one of the co-op work term courses: Public Administration 50.431 ★ or 50.432 ★. While on a work term, students are limited to an additional 0.5 credit course.

The School requires students to have a reading knowledge of French. This requirement is satisfied by successfully completing one of the following courses, or by demonstrating an equivalent level of reading proficiency based on the placement procedure of the Department of French. The French requirement should be satisfied by the end of the Second year.

French
20.106 or 20.160

The course requirements of the B.P.A. program are listed below, by year:

First Year

Economics (1.0 credit)
43.100

Political Science (1.0 credit)
47.100

Approved Options (3.0 credits)

Students are advised to meet the School's language requirement in their First year. If this is not feasible, then the language requirement must be completed by the end of the Second year of the program.

Second Year

Business (1.0 credit)
42.101 ★ and 42.102 ★

Economics (1.0 credit)
43.201 ★, 43.211 ★

Law (1.0 credit)
51.205

Political Science (1.0 credit)
47.200 or 47.201

Approved Option (1.0 credit)

(French requirement must be completed if not completed in First year)

Third Year

Economics (1.0 credit)
43.347 ★ or 43.441 ★; and 43.348 ★ or 43.442 ★

Public Administration (1.0 credit)
50.301 ★, 50.340 ★

Quantitative Methods (1.0 credit)
43.220 or 47.270

Organizational Behaviour (0.5 credit)
42.211 ★ or 42.317 ★ / 43.357 ★ or 51.345 ★ or 53.346 ★

Approved Options (1.5 credit)

Fourth Year

Public Administration (1.5 credits)
Only Fourth year students, i.e. those who have already completed 14.0 credits, will be admitted into 50.401 ★ and 50.498.
50.401 ★, 50.498

Management and Policy Electives (3.5 credits)

Courses drawn from the Management and Policy categories must total 3.5 credits, with at least 1.0 credit coming from each category. Courses other than those listed below may be used as electives, with the written approval of the Undergraduate Supervisor.

(A) Management Electives (1.0 to 2.5 credits)

Business
42.313 ★, 42.312 ★, 42.361 ★

Economics
43.465 ★

Geography
45.433 ★ (82.333 ★)

Political Science
47.300 ★, 47.301 ★, 47.302 ★, 47.303 ★, 47.305 ★, 47.306 ★, 47.403 ★, 47.405, 47.406 ★, 47.407 ★, 47.408 ★, 47.409 ★, 47.416 ★, 47.417 ★, 47.441 ★, 47.446 ★, 47.447 ★, 47.448

Law
51.327 ★, 51.328 ★, 51.350 ★, 51.356 ★, 51.374 ★, 51.440 ★, 51.445 ★, 51.451 ★, 51.457 ★

Architecture
78.340 ★

(B) Policy Electives (1.0 to 2.5 credits)

Philosophy
32.330

Economics

43.330 ★, 43.346 ★, 43.356 ★, 43.360 ★, 43.361 ★, 43.362 ★, 43.363 ★, 43.367 ★, 43.380 ★, 43.385 ★, 43.415, 43.445 ★, 43.457 ★, 43.458 ★, 43.461 ★, 43.467 ★, 43.468 ★, 43.480

Geography

45.320 ★, 45.433 ★

Political Science

47.230, 47.345 ★, 47.366 ★, 47.367 ★, 47.402 ★, 47.413 ★

Law

51.301 ★ (requires permission of the Department), 51.305 ★, 51.353, 51.354 ★, 51.380 ★, 51.467 ★

Sociology-Antropology

53.373 ★, 53.380

Mention: français

Students proficient in French may wish to earn the University's "Mention: français" designation by taking the following pattern of courses in their degree program:

Students must undergo placement testing by the Department of French in order to satisfy the language requirement, and to protect the integrity of the initiative. At least 1.0 credit from the Second, Third or Fourth years must be made up by courses at Carleton.

First Year

1.0 credit in the advanced study of the French language.

Second and Third Years

2.0 credits made up by Political Science 47.201, 47.390, or by courses given entirely in French on French Canadian culture and heritage (French 20.270, 20.372 ★, 20.373 ★), or by other Second-year and Third-year courses offered entirely in French at Carleton or at another university and approved by the Undergraduate Supervisor of the School.

Fourth Year

1.0 credit made up either by Public Administration 50.498 Honours Essay written in French, or by Third- or Fourth-year courses offered entirely in French at Carleton or at another university and approved by the Undergraduate Supervisor at the School.

Certificate in Public Service Studies

The Certificate program is designed primarily for public employees who seek special training in public service subjects at the undergraduate level.

Courses taken for the Certificate may be credited towards a Bachelor of Public Administration or Bachelor of Arts degree. A transfer student from the Certificate program into the Bachelor of Public Administration program will normally be required to take at least 14.0 further credits in addition to those required for the Certificate, to be recommended for the degree. A transfer student into a Bachelor of Arts program will normally be required to take at least 9.0 further credits. At least 5.0 of the credits required for either degree must be completed after the awarding of the Certificate.

Full-time candidates for the Certificate are invited to enquire about possible financial aid.

Admission Requirements

The basic admission requirement is the completion of the OSSD including six OACs or equivalent, with an overall average of 60 percent or better. Special consideration will be extended to other applicants under Mature Applicant regulations.

Candidates may be admitted with advanced standing, but must complete at least 4.0 credits, including all core courses, for the Certificate at Carleton University.

Students who have completed an undergraduate degree are not eligible for admission to the Certificate program. They are encouraged, however, to investigate the undergraduate and graduate degree and diploma programs offered by the School.

Course Requirements

The following courses are required and the following order is suggested:

1. Political Science 47.100
2. Economics 43.100
3. History 24.130 or 24.233 or 24.234 or 24.235
4. Political Science 47.200
5. Public Administration 50.340 ★
6. 1.5 other credits chosen in consultation with the Director according to the needs of the student.

Academic Standing

A candidate for the Certificate must obtain a grade of C or better in at least half of the credits taken at Carleton University for the certificate.

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Public Administration 50.301 ★

Policy Analysis for Public Administration

A multi-disciplinary seminar that involves the participation of several faculty members. It explores various theoretical approaches for analyzing the origins and effects of problems in public policy, and evaluating alternative responses to those problems.

Prerequisite: Third-year standing in Public Administration.

Seminar three hours a week.

Public Administration 50.315 ★

Management in the Public Sector

A course that considers the specific constraints and opportunities of managing in a public-sector organization, including government at all levels and para-statal organizations. Topic may include the accountability regimes of public sector organizations, specific features of the human resource management context, administration of information and material resources, and responsibilities and relationships of managers towards citizens, among others.

Prerequisite: Third-year standing in the B.P.A.P.M. program.

Seminar three hours a week.

Public Administration 50.340 ★

Introduction to Public Administration and Public Policy

An introduction to the theoretical and empirical foundations of the fields of public administration and public policy at federal, provincial and municipal levels.

Precludes additional credit for Political Science 47.240.

Prerequisites: Political Science 47.200 and Third-year standing in Public Administration or an appropriate level in the CPSS Program.

Lectures and discussion three hours a week.

Public Administration 50.401 ★

Selected Topics in Public Administration

A seminar that provides an opportunity for interaction between students and faculty directed toward examining current issues in Public Administration.

Prerequisite: Public Administration 50.301 ★.

Seminar three hours a week.

Public Administration 50.408 ★

Environmental Policy

An examination of Canadian environmental policies and programs set in a comparative political-economic and institutional context. Also offered as the graduate level, with additional or different requirements, as Public Administration 50.508, for which additional credit is precluded.

Prerequisite: Fourth-year standing in the Public Policy and Administration Specialization of the B.P.A.P.M. program. Enrolment is limited.

Public Administration 50.409 ★

Health Policy

An examination of Canadian health policies and programs set in a comparative political-economic and institutional context. Also offered at the graduate level, with additional or different requirements, as Public Administration 50.509, for which additional credit is precluded.

Prerequisite: Fourth-year standing in the Public Policy and Administration Specialization of the B.P.A.P.M. program. Enrolment is limited.

Public Administration 50.431 ★

Co-operative Work Term

Prerequisites: Registration in the Co-operative Education Option of the Bachelor of Public Administration program and permission of the School.

Public Administration 50.432 ★

Co-operative Work Term

Prerequisites: Registration in the Co-operative Education Option of the Bachelor of Public Administration program and permission of the School.

Public Administration 50.459 ★

Tax Policy

An examination of Canadian tax policies set in a comparative political-economic and institutional context. Also offered at the graduate level, with additional or different requirements, as Public Administration 50.559, for which additional credit is precluded.

Prerequisite: Fourth-year standing in the Public Policy and Administration Specialization of the B.P.A.P.M. program. Enrolment is limited.

Public Administration 50.460 ★

Sustainable Development and Industrial and Innovation Policy

An examination of sustainable development ideas and ethics and their links to Canadian and comparative industrial and innovation policies including policies that affect: Research and Development incentives, intellectual property, trade and competition, and the knowledge-based services delivered by government to business and consumers. Also offered at the graduate level, with additional or different requirements, as Public Administration 50.560, for which additional credit is precluded.

Prerequisite: Fourth-year standing in the Public Policy and Administration Specialization of the B.P.A.P.M. program. Enrolment is limited.

Public Administration 50.464 ★

Social Policy

A seminar which will study the nature and historical development of social programs and the welfare state in capitalist countries, with particular focus on Canada. The course will concentrate on developing a critical understanding of the social forces shaping these programs and evaluating the implications of current debate on the future of social policy in Canada. Also offered at the graduate level, with additional or different requirements, as Public Administration 50.564, for which additional credit is precluded.

Prerequisite: Fourth-year standing in the Public Policy and Administration Specialization of the B.P.A.P.M. program. Enrolment is limited.

Public Administration 50.471 ★

Gender and Public Policy

An examination of policy and policy-making as they pertain to gender relations within the state as well as in society at large. The course looks at the negative and positive effects of public policy on gender relations in the family and the labour market. Also offered at the graduate level, with additional or different requirements, as Public Administration 50.571 ★, for which additional credit is precluded.

Prerequisite: Fourth-year standing in the Public Policy and Administration Specialization of the B.P.A.P.M. program. Enrolment is limited.

Public Administration 50.473 ★

Ethics in Public Service

A course that introduces students to the ethical assumptions and ambiguities associated with the organizational relationships and situational loyalties of the public service. Various perspectives on the role of the state and para-statal organizations in Canadian society will be reviewed, providing an opportunity to consider whether institutions themselves can advance.

Prerequisite: Fourth-year standing in the B.P.A.P.M. program.

Seminar three hours a week.

Public Administration 50.474 ★

Regional Policy

This seminar examines the theory and practice of regional policy, using the Canadian experience as a case study. It begins with an analysis of regionalism and regional economic concerns. Then the alternative policy approaches that are available and their theoretical underpinnings are considered, and a critical review of Canadian efforts is undertaken. Particular emphasis is placed on the way in which federalism shapes perceptions of regional issues, and influences the approach to solutions. Regional development concerns in the Third World countries may be analyzed in brief if students from that region participate. Also offered at the graduate level, with additional or different requirements, as Public Administration 50.574, for which additional credit is precluded.

Prerequisite: Fourth-year standing in the Public Policy and Administration Specialization of the B.P.A.P.M. program. Enrolment is limited.

Public Administration 50.486 ★

Aboriginal Policy

An examination of Canadian policies and programs on aboriginal peoples and aboriginal peoples' own policies as nations set in a comparative political-economic and institutional context. Also offered at the graduate level, with additional or different requirements, as Public Administration 50.586, for which additional credit is precluded.

Prerequisite: Fourth-year standing in the Public Policy and Administration Specialization of the B.P.A.P.M. program. Enrolment is limited.

Public Administration 50.487 ★

Trade Policy

An examination of Canadian multilateral and regional trade policies and programs set in a comparative political-economic and institutional context. Also offered at the graduate level, with additional or different requirements, as Public Administration 50.587, for which additional credit is precluded.

Prerequisite: Fourth-year standing in the Public Policy and Administration Specialization of the B.P.A.P.M. program. Enrolment is limited.

Public Administration

Public Administration 50.489 ★

Education Policy

An examination of Canadian policies and programs in education set in a comparative political-economic and institutional context. Also offered at the graduate level, with additional or different requirements, as Public Administration 50.589, for which additional credit is precluded.

Prerequisite: Fourth-year standing in the Public Policy and Administration Specialization of the B.P.A.P.M. program. Enrolment is limited.

Public Administration 50.498

Honours Essay

Tutorial hours arranged.

Public Affairs and Policy Management (Public Affairs and Management)

Loeb Building
Telephone 520-7560
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Academic Administration

Associate Dean and Director, Eileen Saunders

Bachelor of Public Affairs and Policy Management

General Information

As collaboration between public, private and non-governmental organizations increases, there is growing demand for individuals who possess the analytical skills and substantive knowledge necessary to participate in policy planning, policy implementation and policy management. This program responds to that demand by offering a challenging interdisciplinary study of public affairs and policy management. It seeks to combine academic excellence in the study of public affairs and policy management with the acquisition of practical skills and experience in policy-oriented problem solving, implementation and management. Graduates will be prepared to operate effectively in a wide range of institutional and policy contexts. They will have developed the following: a perspective on, and substantive knowledge of, the interactions of government bodies, private organizations and non-governmental groups; an ability to think critically about the design and implementation of policy solutions to pressing public problems; and a significant facility with particular analytical and applied skill sets. Carleton University is uniquely placed to offer this program. Its location in Ottawa provides a proximity to government organizations, national associations, international organizations and non-governmental organizations.

Graduates of this program will receive the degree of Bachelor of Public Affairs and Policy Management (Honours). The program's unique features include a structured core curriculum of 'foundation' courses for all students, a number of designated courses across a range of disciplines and the choice of an area of specialization in selected fields of study. In addition, the program provides an opportunity for students to apply for cooperative work-study terms, in order to integrate their academic study with practical work experience.

Program Requirements

Candidates for the degree must present 20.0 credits and satisfy the Language Requirement. 4.0 credits are taken in the required foundation courses (Public Affairs and Policy Management 58.100, 58.200, 58.300 ★ 58.400 ★ and 58.498), 5.5 credits are designated courses in a selected number of disciplines, 6.5 credits are Specialization credits chosen in the student's particular area of focus and four credits are free electives. The normal sequence for completion is as follows:

First year

- Public Affairs and Policy Management 58.100
- Economics 43.100
- Political Science 47.200 or 47.215
- History 24.130, 24.102 or 24.170
- 1.0 Elective credit

Second Year

- Public Affairs and Policy Management 58.200
- Political Science 47.270 or Mass Communication 27.201 or Economics 43.220
- Law 51.205 or 51.363 ★ and 51.364 ★
- 1.0 Specialization credit
- 1.0 Elective credit

Third Year

- Public Affairs and Policy Management 58.300 ★
- Business 43.362 ★
- 3.0 Specialization credits
- 1.0 Elective credit

Fourth Year

- Public Affairs and Policy Management 58.400 ★, 58.498
- 2.5 Specialization credits
- 1.0 Elective credit

Note: Some Specialization areas may require or may recommend one of these options in particular. Students are advised to check the calendar entry under their Specialization Program of Study. Students choosing 43.220 should ensure that they have the necessary prerequisites for this course.

In addition, prior to graduation, students must satisfy a language requirement. This requirement may be satisfied in one of the following ways:

- successful completion of an approved French language credit (20.145 or 20.160);
- placement at a demonstrated competency level equivalent to satisfactory completion of 20.145 or 20.160 following a self-assessment questionnaire and interview administered by the Department of French (for students who already possess demonstrated capacity in French);
- successful completion of French Immersion in high school or possession of a Bilingual Diploma or Certificate.

Students should note that they will be required to use one of their optional credits if they choose to satisfy the language requirement through an approved French language credit. For students whose first language is not English, or for students whose Specialization interests require a language other than French, the Language Requirement may be met by substituting another language for French. Permission for substitution may be sought from the Program Coordinator. Students registering in the Specialization in International Studies should note the additional language requirement within that program of study. Please see calendar entry for details.

Co-operative Work Term Option

Full-time students with a GPA of 9.0 or better after 15.0 credits are eligible to apply for the Co-operative Work Term Option. These work terms are normally four months in duration, and are at a

junior level within government, non-government or private sector organizations. Students on a work term may concurrently take no more than one 0.5 credit course.

Work terms provide students with opportunities to integrate their academic experience with applied aspects of public affairs and management. The Co-operative Work Term Option is neither mandatory nor guaranteed, and is not for credit. Students are normally expected to complete at least one term of full time studies following the completion of their co-operative work term. Application for co-operative work terms should be made in writing to the Co-operative Placement Office in the Faculty of Public Affairs and Management no later than six months before the first work term. Students can be considered for this Option only if they are eligible to work in Canada. Only Canadian citizens may apply for co-operative work terms with the Public Service Commission.

Program Specializations

There are seven Specialization areas available within the program. All students are required to declare their area at the point of eligibility for Second-year standing.

Each area of Specialization represents a structured program of study and all have a significant interdisciplinary and policy-relevant aspect. The student's area of Specialization is noted on the transcript and the diploma.

Admission Requirements

Admission to the program is based on superior scholarly achievement. Applicants normally must have the OSSD, or the equivalent, including six OAC's (or their equivalent), with an overall average of 80 percent or better.

Advanced Standing and Transfer of Credits

Applications for admission with advanced standing to the program will be evaluated individually by the Program Management Committee. Advanced standing will be granted only for those courses deemed to be appropriate to the program. On admission, students will not receive credit for courses graded below C-.

Continuation to Second Year

Students are guaranteed entry into Second year, provided they meet the following criteria:

1. A CI of 7.00 or better
2. No grade below C- or notation of *ABS* in more than 1.0 credit.
3. Grades below C- may not have been received in courses worth more than 1.0 credit.
4. No more than 1.0 credit of *Abs* notation.

Academic Standing

Following their continuation into Second year, students are considered in good standing and eligible to continue provided they have a CI of 6.5 or better, maintain a cumulative GPA of 6.5 or better in the Honours courses (in the B.P.A.P.M., Honours means core, required and specialization courses) and receive no grade below C- or notation of *Abs* in more than 1.0 credit per academic year.

Probation is not available in the B.P.A.P.M. Program.

Graduation Requirements

In order to graduate, students must fulfill all Program Requirements including Specialization Requirements, as well as satisfy all University graduation regulations (see p.48) and all Faculty regulations. (see p. 74).

Specialization Options:

1. Public Policy and Administration Specialization
2. Human Rights Specialization
3. Development Studies Specialization
4. International Studies Specialization
5. Communication and Information Technology Policy Specialization
6. Strategic Public Opinion and Policy Analysis Specialization
7. Social Policy Specialization

Public Policy and Administration Specialization

The Public Policy and Administration Specialization offers students an opportunity to develop the conceptual abilities, knowledge base, and practical skills to prepare them for work in public sector organizations, including all levels of government and the para-statal or third sector. It also provides an excellent preparation for graduate studies. It is an interdisciplinary area of study, building especially upon the research and teaching strengths of the university's School of Public Administration, and it presents students with opportunities to understand the tools available for management and policy analysis, to develop a critical understanding of the key concepts used for policy analysis and management, and to apply this understanding to problems in the public sector in a realistic and sophisticated manner.

Specialization Program of Study

Second Year

- Law 51.205
- Business 42.101 ★ and 42.102 ★, or Economics 43.201 ★ and 43.211 ★

Third Year

- Economics 43.347 ★ and 43.348 ★
- Law 51.356 ★
- Political Science 47.341 ★, and 47.344 ★ or 47.345 ★
- Public Administration 50.315 ★

Fourth Year

- Public Administration 50.473 ★
- Two of: Public Administration 50.408 ★, 50.409 ★, 50.459 ★, 50.460 ★, 50.464 ★, 50.471 ★, 50.474 ★, 50.486 ★, 50.487 ★, or 50.489 ★ (as these courses are also taken by MA students, the enrollment of undergraduates in each one will normally be limited to five BPAPM students who are in the PPA Specialization)
- Two of: Business 42.312 ★, 42.415 ★, 42.417 ★, 42.418 ★, 42.440 ★, or 42.467 ★; Economics 43.357 ★; Political Science 47.346 ★, 47.416 ★, or 47.448 ★; or Law 51.305 ★, 51.341 ★, 51.345 ★, 51.353 ★, 51.442 ★, or 51.457 ★ (prerequisites are required for some of these courses)

Human Rights Specialization

Many contemporary (and past) political, economic, social, and legal debates and conflicts have developed around a discourse of rights. Indeed, struggles to recognize, protect and promote the dignity and worth of human beings have mobilized social movements, transformed local, national and international structures, and electrified historical periods. This specialization provides interdisciplinary study of human rights in its public affairs context. Courses address key human rights questions, debates, conflicts and violations in the process of developing expertise in four thematic areas: theories and approaches to human rights; human rights practice and organizations; human rights law; and the social, cultural and ethical dimensions of human rights.

Specialization Program of Study

Second Year

- Law 51.205
- Political Science 47.270 or Mass Communications 27.201

-Law 51.215 ★ and Philosophy 32.213 ★

Third Year

-Law 51.353 ★, Political Science 47.337 ★; Social Work 52.327 ★; and

-One of Law 51.311 ★/32.311 ★, Philosophy 32.211 ★, 2.212 ★, 32.313 ★, Political Science 47.319 ★; and

-One of Law 51.364 ★ or Political Science 47.360 ★

-Specialization Options

Fourth Year

-Law 51.464 ★; and

-One of Political Science 47.419 ★ or Law 51.359 ★

-Specialization Options

Notes:

1. Students may present as part of their specialization options alternate choices in the list of required courses.
2. Students may present as part of their open degree electives, courses listed in the specialization options.
3. Students are responsible for meeting prerequisites in selecting optional specialization courses.

Human Rights Specialization Options Courses

Students are required to take a minimum of 2.0 credits in listed Specialization options courses. Only 1.0 credit in options may be presented at the 200-level or below.

Students may also take human rights related courses not included on the list of Specialization Options courses (e.g., special topics courses or specialized courses related to gender, race, aboriginal persons, criminal justice, environment, or particular regions) with permission of the Specialization Supervisor.

Specialization options courses are listed thematically. However, options courses may be taken in any theme or combination of themes. Not all courses listed may be offered in a particular academic session. The content of topics courses may vary from year to year; only topics with human rights content may be presented. Students should consult with the Specialization Supervisor where any doubt exists.

Human Rights: Theories and Approaches

Law 51.411 ★; 51.412 ★

Sociology/Anthropology 56.101

Human Rights Practice and Organizations

European and Russian Area Studies 55.402 ★

Geography 45.337 ★

Law 51.480

Political Science 47.306 ★; 47.425 ★; 47.455 ★

Social Work 52.325 ★

Sociology 53.348 ★

Human Rights Law

Law 51.341 ★; 51.351 ★; 51.363 ★; 51.406 ★; 51.439 ★; 51.465 ★; 51.467 ★

Social, Cultural and Ethical Dimensions of Human Rights

European and Russian Area Studies 55.408

History 24.281; 24.320

Law/Philosophy 51.311 ★/32.311 ★

Philosophy 32.150, 32.211 ★; 32.212 ★, 32.214 ★, 32.313 ★, 32.330

Philosophy/Mass Comm 32.290/27.290

Political Science 47.319 ★; 47.426 ★

Social Work 52.430 ★

Sociology 53.345; 53.347 ★

Sociology/Anthropology 56.202; 56.234 ★; 56.218 ★; 56.465 ★

Women's Studies 09.280 ★

Development Studies Specialization

This specialization provides the student with an understanding of development processes in various regions of the world, including Third World, transitional (post-communist), and indigenous societies. Building upon knowledge and skills imparted in the core courses for the degree, the specialization curriculum familiarizes students with various concepts and processes of development, with the philosophy and principles underlying international assistance programs, and with key issues in the formulation and management of development policy. The concentration is inter-disciplinary; it includes the study of economic, social and political development; the involvement of social forces in community development; market and alternative economic structures; policy formulation, implementation, and project management; and an understanding of the nature and operation of international organizations in the development field.

Students in this specialization are encouraged to select 47.215 and 24.170 in the core B.P.A.P.M. program. Beyond the required specialization credits, each student must select 3.5 additional credits from a list of approved specialization options (below). Students are encouraged to focus some of the option credits on a specific development theme or region. Among the possible regional foci are Central and Eastern Europe, Latin America and the Caribbean, Sub-Saharan Africa, and Asia. The thematic foci include community development; indigenous peoples and development; the environment and development; and social and political issues in development. At least one of the option credits must be at the 400 level. With the approval of the specialization adviser, students may include one credit in a language related to the specialization work, beyond the language requirement for the B.P.A.P.M. degree.

Specialization Program of Study

Second Year

- Economics 43.363 ★

- Social Work 52.326 ★

Third Year

- Economics 43.364 ★

- 2.5 Specialization Option credits selected from the list below

Fourth Year

- International Affairs 46.422 ★/Political Science 47.449 ★

- Political Science 47.414 ★

- Political Science 47.415 ★

- 1.0 Specialization Option credit selected from list below

Specialization Option Credits

Regional Foci

A. Central and Eastern Europe

Economics 43.370

Geography 45.360 ★, 45.460 ★

Political Science 47.314, 47.328 ★, 47.329 ★

European and Russian Studies 55.402 ★, 55.407 ★, 55.406 ★, 55.407 ★, 55.409 ★, 55.410 ★, 55.411 ★

History 24.360

B. Latin America and the Caribbean

Political Science 47.324 ★, 47.325 ★, 47.467 ★

History 24.237, 24.374, 24.375 ★, 24.376 ★

C. Africa

Political Science 47.309 ★, 47.310 ★, 47.417 ★, 47.423 ★, 47.482 ★

Geography 45.330 ★, 45.362 ★

History 24.275

D. Asia/Middle East

Political Science 47.312, 47.315, 47.323 ★, 47.332

History 24.285

Economics 43.487 ★

Sociology/Anthropology 56.479 ★

Thematic Foci*D. Environment and Development*

Economics 43.386 ★
 Geography 45.211 ★, 45.329 ★, 45.330 ★, 45.336 ★, 45.404 ★
 European and Russian Studies 55.407 ★
 Sociology/Anthropology 56.253 ★
 Law 51.480 ★

E. Indigenous Peoples and Development

Sociology/Anthropology 54.207 ★, 56.307 ★, 54.319 ★, 56.420 ★, 54.470 ★
 History 24.353 ★
 Social Work 52.412 ★
 European and Russian Studies 55.409 ★
 Political Science 47.426 ★

F. Gender and Development

Sociology/Anthropology 56.248 ★, 56.249 ★, 56.479 ★
 Political Science 47.352 ★, 47.450 ★
 History 24.375 ★

G. Social and Political Development Issues

Social Work 52.210 ★, 52.311 ★, 52.414 ★
 Sociology/Anthropology 56.361 ★, 54.467 ★
 Political Science 47.455 ★
 International Affairs 46.412 ★

International Studies Specialization

Globalization, global environmental change, international terrorism, multinational corporations, and the spread of inter-ethnic conflict. Global change challenges the very intellectual categories that have organized theory and practice of human communities in the modern era. This specialization addresses the need for interdisciplinary study in international relations. It focuses on analysis of the development of policy and its results. The specialization core courses are tailored to students' needs, giving them the background and then developing their skills in policy analysis in international relations. International relations is a particular strength at Carleton. Over one hundred courses in international relations and areas studies are offered.

The specialization is developed with potential employers in mind. The degree offers the student a set of skills and capacities that will be attractive to employers in the public and private sector. While there is an obvious relationship with careers in international relations and in the Foreign Service, students graduating from this BPAPM specialization will be notable more generally for their policy focus, balanced interdisciplinarity and applied knowledge. Students who wish to go onto graduate work in Public Affairs and Management or the Social Sciences more generally will (with certain exceptions) be able to do so with few extra requirements.

Specialization Requirements

Students in the International Studies specialization of the BPAPM will take courses as in the B.P.A.P.M. advised core program with the following guidelines:

- Students considering the International Studies specialization are encouraged to take History 24.102 or 24.170 as their history course in First year.

- 42.362 ★ can be taken in either Third or Fourth year.

The language requirement will be fulfilled with 2.0 credits in one or two languages (or equivalent level of proficiency as demonstrated by successful performance on a language test at the intermediate level if one language is used, or two tests at the introductory level if two languages are selected). Students should note that they will be required to use two of their optional credits if they choose to satisfy the language requirement through course work.

Specialization Program of Study**Second Year**

- Law 51.363 ★ and Law 51.364 ★
 - Political Science 47.260

Third Year

- International Affairs 46.300
 - Economics 43.361 ★ and 43.362 ★
 - 1.0 specialization credit in International Studies selected from the list below (1.5 credits if Business 47.362 ★ is taken in the Fourth year)

Fourth Year

- One of Political Science 47.414 ★, 47.415 ★, 47.463 ★, 47.464 ★ and 47.460
 - One of International Affairs 46.411 ★, 46.412 ★ and 46.413 ★
 - 1.0 specialization credit in International Studies selected from the list below (.5 credit if Business 42.362 ★ is taken in Fourth year)

Specialization Option Courses

(This list is not exhaustive; other related courses may be taken by petition)

International Conflict, War and Strategic Studies

International Affairs 46.411 ★
 Political Science 47.317 ★, 47.363 ★, 47.408 ★
 Sociology/Anthropology 56.358

Global Political Economy

Economics 43.370 ★, 43.386 ★, 43.486 ★, 43.487 ★
 European and Russian Studies 55.406 ★
 International Affairs 46.413 ★
 Political Science 47.373 ★, 47.463 ★, 47.464 ★
 History 24.371 ★
 Business 42.373 ★

International Development

Economics 43.363 ★, 43.364 ★
 International Affairs 46.412 ★, 46.422 ★
 Political Science 47.310 ★, 47.414 ★, 47.415 ★, 47.449 ★
 Sociology/Anthropology 56.360
 Geography 45.329 ★, 45.330 ★

International Law and Organization

Law 51.327 ★, 51.328 ★, 51.464 ★, 51.465 ★
 Political Science 47.360 ★

International Theory and Miscellaneous International Studies

Political Science 47.352 ★, 47.361 ★, 47.365 ★, 47.455 ★, 47.460
 Geography 45.337 ★, 45.440 ★
 History 24.380 ★, 24.480

Area Studies (Some of the area courses are listed in the themes above)

North and South America:

Political Science 47.311, 47.3xx ★ Mexican Politics, 47.322, 47.366 ★, 47.367 ★, 47.466 ★, 47.467 ★
 European and Russian Studies 55.409 ★
 History 24.336 ★, 24.349, 24.374, 24.375 ★, 24.376 ★

Africa:

Political Science 47.423 ★, 47.427 ★, 47.482 ★
 Geography 45.362 ★

Asia:

Political Science 47.312 ★, 47.313 ★, 47.315, 47.323, 47.483 ★, 47.484 ★

European and Russian Studies:

European and Russian Studies 55.405 ★, 55.408 ★, 55.411 ★
 Political Science 47.314, 47.326 ★, 47.327 ★, 47.328 ★, 47.329 ★, 47.461 ★, 47.493 ★, History 24.365 ★

Communication and Information Technology Policy Specialization

The CITP specialization is concerned with telecommunications, broadcasting, publishing, and the Internet. The specialization focuses on the political, economic, legal and socio-cultural processes shaping and affected by changes in these media. Courses provide a grounding in communication policy, the economics of information and media, the comparative analysis of regulatory regimes and public policy environments. Key themes are content regulation, the role of communication policy in a democratic society, control of distribution, copyright, intellectual property rights, privacy, pornography and fraud.

Specialization Program of Study

Second Year

Law 51.205

Mass Communication 27.230 ★ or 27.232 ★

0.5 additional credits chosen from: Business 42.240 ★, Economics 43.201 ★, Mass Communication 27.230 ★ or 27.232 ★, 27.251 ★

Third Year

Law 51.322 ★ and 51.352 ★

Political Science 47.341 ★ or 47.346 ★

1.5 credits chosen from: Economics 43.320 ★, Law 51.305 ★, 51.356 ★,

Mass Communication 27.305 ★, 27.306 ★, 27.343 ★, Political Science 47.306 ★

Fourth Year

Mass Communication 27.435 ★

2.0 credits chosen from: Business 42.440 ★ (requires 42.240 ★), 42.444 ★ (requires 42.240 ★), Economics 43.425 ★ (requires 43.201 and precludes additional credit for 43.320), Law 51.457 ★, Political Science 47.403 ★, 47.441 ★, 47.447 ★, Public Administration 50.568 ★

Strategic Public Opinion and Policy Analysis Specialization

For those students who are interested in learning how public behaviour and opinion are analysed, this specialization offers a concerted stream of courses in this subject, combining academic study and practical application. Students will have direct contact with a rapidly growing and recognized professional field. For example, public affairs experts are involved in analysing opinion for governments, corporations, unions and voluntary organizations engaged in making contributions to the formation of public policy. Others are involved in the analysis of opinions and preferences in elections, including the tracking of voters for the purposes of planning issue stances and media strategies. Still others are involved in taking the results of market and opinion analysis and using that information to plan media activity and strategy. These are just a few of the possibilities in this field.

Specialization Program of Study

Second Year

- Mass Communication 27.201 or Political Science 47.270

- Law 51.205 or Law 51.363 ★ and 51.364 ★

- Journalism 28.225 ★

- Business 42.224 ★ or Business 42.240 ★

Third Year

- Mass Communication 27.300

- 2.0 credits selected from: Business 42.325 ★, 42.327 ★, Mass Communication 27.346 ★, Political Science 47.304 ★, 47.336 ★, 47.342 ★, 47.345 ★, 47.346 ★, 47.347 ★

Fourth Year

- 1.0 credit selected from: Political Science 47.471 ★, Mass Communication 27.400 ★, 27.402 ★

- 1.5 credits selected from the following list: Journalism 28.400, Political Science 47.400C, 47.403 ★, 47.424 ★, 47.441 ★ and 47.447 ★

Note: Students are advised to ensure they have the necessary prerequisites when choosing Specialization options

Social Policy Specialization

The B.P.A.P.M. specialization in social policy provides an opportunity for focused study on issues dealing with individual, family, community and societal needs. The specialization includes a study of the social, political, economic, and cultural environments within which these needs arise and how societies guide decisions and manage actions to meet these needs collectively. This specialization will prepare students for planning, implementing, managing and evaluating social policies, programs and services.

Specialization Program of Study

Second Year

- Law 51.205

- Economics 43.347 ★ or 43.348 ★

- Social Work 52.210 ★

Third Year

- Economics 43.347 ★ or 43.348 ★

- Social Work 52.310 ★

- Political Science 47.306 ★ or 47.341 ★

- 0.5 credit from selected list of Law Specialization options (see below)

- 0.5 credit from selected list of either Business or Sociology Specialization Options (see below)

- 0.5 credit from selected list of any Specialization Option (see below)

Fourth Year

- Sociology 443 ★

- Social Work 415 ★

- 0.5 credit from selected list of Law Specialization options (see below)

- 0.5 credit from selected list of Political Science Specialization Options (see below)

- 0.5 credit from selected list of either Business or Sociology Specialization Options (see below)

Note: Students should note that they must take at least 0.5 credit in Business Specialization options at some point in their specialization program.

Specialization Option Courses

Students are to choose from the following list of courses for their social policy specialization courses in third and fourth year.

Economics

43.326 ★, 43.341 ★, 43.356 ★,
43.357 ★, 43.436 ★, 43.445 ★,
43.465 ★

Political Science

47.306 ★, 47.319 ★, 47.341 ★,
47.342 ★, 47.344 ★, 47.345 ★,
47.350 ★, 47.413 ★, 47.416 ★,
47.417 ★, 47.419 ★, 47.425 ★,
47.447 ★

Social Work

52.311 ★, 52.422 ★, 52.325 ★,
52.424 ★, 52.326 ★, 52.430 ★,
52.327 ★, 52.412 ★, 52.413 ★,
52.514 ★

Sociology

53.303 ★, 53.304 ★, 53.373 ★,
53.401 ★

Business

42.312 ★, 42.317 ★,
42.415 ★, 42.423 ★

Law

51.300 ★, 51.301 ★,
51.305 ★, 51.306 ★,
51.333 ★, 51.335 ★,
51.336 ★, 51.337 ★,
51.341 ★, 51.342 ★,
51.345 ★, 51.354 ★,
51.356 ★, 51.358 ★,
51.380 ★, 51.401 ★,
51.437 ★, 51.438 ★,
51.442 ★, 51.454 ★,
51.457 ★, 51.467 ★

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Public Affairs and Policy Management 58.100

Introduction to Public Affairs and Policy Management

The theoretical, philosophical and ethical foundations for the study of public affairs and policy management. Drawing from classic and contemporary texts in political philosophy and theory, students will consider issues relating to the nature of democracy, civic society and social organizations, the public, public affairs and public interest.

Prerequisite: Registration in the Bachelor of Public Affairs and Policy Management Program.

Lecture and discussion three hours a week.

Public Affairs and Policy Management 58.200

Policy: Analysis, Implementation and Evaluation

The institutions and processes of policy-making, implementation and evaluation. Students will examine forces that shape policy deliberations and consider alternative tools for managing policy action and policy evaluation. The course will include various theoretical approaches to understand the origins of policy, and methods by which programs are designed and assessed.

Prerequisite: Public Affairs and Policy Management 58.100 and good standing in the Bachelor of Public Affairs and Policy Management program.

Lecture and discussion three hours a week.

Public Affairs and Policy Management 58.300 ★

Policy Research

An examination of the research strategies and techniques relevant to policy analysis and evaluation. Using the case study method, the role of research and research organizations in the policy process is discussed. The issue of ethical dilemmas in policy research is also considered.

Prerequisite: Political Science 47.270 or, Mass Communication 27.201, or Economics 43.220 and good standing in the Bachelor of Public Affairs and Policy Management program.

Lecture and discussion three hours a week

Public Affairs and Policy Management 58.400 ★

Capstone Seminar in Public Affairs and Policy Management

A policy workshop focusing on the application of public affairs analysis to develop problem solving and research skills. The seminar will be policy-focused and organized by area of Specialization in the program. Students, working in small groups, will examine concrete policy problems, actual or simulated, in specific institutional contexts.

Prerequisite: Public Affairs and Policy Management 58.300 ★ and good standing in the Bachelor of Public Affairs and Policy Management program.

Seminar three hours a week

Public Affairs and Policy Management 58.498

Honours Research Essay

The Honours essay, which represents a major research paper in the student's Area of Specialization, is carried out under the direction of a faculty supervisor who is either selected by the candidate or assigned early in the year. The Honours essay is evaluated by both the supervisor and an appointed reader. For Faculty regulations regarding the Honours Research Essay, see p. 67.

Prerequisite: Fourth-year standing in the Bachelor of Public Affairs and Policy Management program.

College of the Humanities: Religion (Arts and Social Sciences)

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Supervisor of Graduate Studies, Joseph G. Ramisch

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General Information

The general purpose of courses offered in this Discipline is to promote a sensitive and intellectually mature understanding of the basic ideas and concerns of outstanding religious leaders and movements irrespective of whether these coincide or conflict with individual convictions. Religious writings are studied critically, in an attempt to understand their meaning, to grapple with their problems and to assess their significance both in their original cultural context and for our own situation.

Programs of Study

Students who elect Religion as their B.A. (Honours) or B.A. subject will consult with their respective adviser before registration each year.

Graduation Regulations

In order to graduate, students must fulfill all University graduation regulations (see p. 48), all Faculty regulations including those for First Year Seminars and Breadth requirements (see p. 63), in addition to all Major regulations and requirements as set out below.

Honours Programs

B.A. (Honours) in Religion

The Honours program requires 10.0 credits in Religion:

1. 34.100★, 34.101★, and 34.125★
2. 34.331★
3. 34.480★ and 34.498
4. 5.5 additional credits in Religion, 2.0 credits of which must be at the 300-level or above.

Courses must be selected in consultation with the Undergraduate Adviser.

Combined Honours Program

The Combined Honours program requires 7.0 credits in Religion:

1. 34.100★, 34.101★, and 34.125★
2. 34.331★
3. 34.480★ and 34.499 (1.0 credit Honours Essay).
4. An additional 1.0 credit at the 300-level or above.

Courses must be selected in consultation with the Undergraduate Adviser.

Combined Honours in Philosophy and Religion

Philosophy: At least 7.0 credits including:

1. an introductory course or equivalent;
2. 6.0 credits beyond the 100-level including:
 - (a) 2.0 credits in history of philosophy;
 - (b) Philosophy 32.260, or if taken already as Religion 34.260 or if not available, 1.0 credit in philosophical problems, selected in consultation with the Honours Adviser;
 - (c) 1.0 credit at the 400-level.

Religion: Requirements are those listed above for the Combined Honours program.

B.A. Programs

A B.A. program requires 6.0 credits in Religion, including 34.100★, 34.101★, and 34.125★, 34.331★ and an additional 1.0 credit at the 300-level or above.

Courses must be selected in consultation with the Undergraduate Adviser.

Concentration in Jewish Studies

Students majoring in Religion who include as part of their requirements the following courses in Jewish Studies are eligible for the notation of Concentration in Jewish Studies:

Religion

34.226 ★, 34.258 ★, 34.271 ★, 34.278, 34.355 ★, and one of 34.257 ★ or 34.259 ★.

Minor in Religion

A Minor in Religion requires 4.0 credits in Religion, including 1.0 credit at the 100-level and at least 1.0 credit at the 300-level or above.

Courses must be selected in consultation with the Undergraduate Advisor.

Requirement for Breadth, for students in B.A. or B.A.(Honours) degrees

Category for Breadth	Courses in this unit
The temporal dimension of human societies, analyzing times before the present era or societies other than our own	(34.) 100 ★, 101 ★, 258 ★, 206 ★, 212 ★, 227 ★, 230 ★, 370, 271 ★, 278, 380, 323, 378 ★
The artifacts of the imagination in literature and/or other forms, or that addresses the life of the imagination and culture.	(34.) 257 ★, 259 ★, 203 ★, 226 ★, 238 ★, 272 ★, 303 ★, 304 ★, 305 ★, 328, 330
The understanding of social, technological and/or natural processes and the ways in which that understanding is obtained in science and social science.	(34.) 125 ★, 222, 243, 260, 266 ★
Matters of human values, ethics and social responsibilities	

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

First-Year Seminar in Religion 01.151

Interpretations of Religion

Modern enquiries into the nature of religion from various perspectives such as anthropology, history, psychology, sociology and theology. Different myths, symbols, scriptures, doctrines, codes and rituals of religious traditions are examined. Limited enrolment. Precludes additional credit for Religion 34.125, 34.125 ★ or 34.202. Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminar three hours a week.

Religion 34.100 ★

Introduction to Judaism, Christianity, and Islam

A survey of the basic beliefs and practices of these major religious traditions from their beginnings to the present.

Lecture three hours a week.

Religion 34.101 ★

Introduction to Hinduism, Buddhism, and the Religions of China and Japan

A survey of the basic beliefs and practices of these major religious traditions from their beginnings to the present.

Lecture three hours a week.

Religion 34.125 ★

Interpretations of Religion

Modern enquiries into the nature of religion from various perspectives such as anthropology, history, psychology, sociology and theology. Different myths, symbols, scriptures, doctrines, codes and

rituals of religious traditions.

Precludes additional credit for Religion 34.125 or 34.202.

Lecture three hours a week.

Religion 34.126

The Interpretations of Religious Experience

The variety of religious experiences and their interpretations: myth, literature, art and religious doctrine. Topics include time, self, the Other, journey and wisdom. Examples ranging from shamanistic experience to the abstractions of Buddhist philosophy.

Lectures three hours a week.

Religion 34.203 ★

Women in the Christian Tradition

An examination of the status of women in Christianity, including such themes as images of women and gender roles in churches, recent feminist theologies, practical questions such as inclusive language and the ordination of women, and alternative approaches to Christian spirituality.

Lecture three hours a week.

Religion 34.205 ★

Introduction to the Hindu Tradition

An introduction to the basic beliefs, myths and symbols, methods of meditation and ethical principles developed in the main branches of the Hindu tradition. The study includes a survey of movements stemming from the Hindu tradition such as Transcendental Meditation and Krishna Consciousness.

Precludes additional credit for Religion 34.105 ★.

Lecture three hours a week.

Religion 34.206 ★

The Hindu Tradition: The Formative Period

A historical survey of the formation of the Hindu scriptures, the development of basic philosophic concepts and the establishment of the Shiva, Vishnu and Goddess traditions. Discussions of Hindu practices of meditation and presentations of Hindu religious art are included.

Prerequisite: Second-year standing.

Lecture two hours a week.

Religion 34.212 ★

Graeco-Roman Religions

A study of selected topics in Graeco-Roman religion, such as Homeric religion, chthonic cults, the Sophists, astrology, ruler cults, mystery religions and gnosticism.

Lecture three hours a week.

Religion 34.216 ★

Introduction to the Buddhist Tradition

An introduction to the basic beliefs and practices of the Buddhist tradition and a brief survey of its development and transformations in India, Sri Lanka, Southeast Asia, Tibet, China and Japan. Precludes additional credit for Religion 34.106 ★.

Lecture three hours a week.

Religion 34.222

Introduction to the Psychology of Religion

An introduction to the psychology of religion, which examines the major contributions of psychology to the study of religion, religious experience, and the religious personality through various individuals and schools such as those of James, Freud, Jung, Fromm, Erickson and Maslow.

Precludes additional credit for Religion 34.112 ★ and 34.122.

Lecture three hours a week.

Religion 34.226 ★

Judaism and the Jews in the Biblical Era

An introduction to the history of Judaism and the Jews as seen through biblical and non-biblical sources. Special emphasis is placed on the evolution of leadership, community, and institutions as the Hebrews move from tribal to national identity.

Precludes additional credit for Religion 34.102 ★ and 34.120.
Lecture three hours a week.

Religion 34.227 ★

The History and Literature of Early Christianity

The rise of the Christian movement as revealed in the New Testament and other early evidence. Topics will include the Hellenistic and Jewish context, Jesus, Paul, Jewish Christianity, the Johannine writings, feminist and sociological approaches to the early church. Precludes additional credit for Religion 34.103 ★ and 34.120.
Lecture three hours a week.

Religion 34.228

From Christ to Constantine

The history, literature and thought of early Christianity. The first term will concentrate on the New Testament and its background, the second on subsequent developments that led to the Christianization of the Roman Empire. Precludes additional credit for Religion 34.103 ★ and 34.227 ★.
Lectures three hours per week.

Religion 34.230 ★

Mysticism

A historical and functional study of mystical experience in its religious context, relying on examples from selected traditions such as the Christian, Buddhist, Hindu, Jewish and Muslim. Precludes additional credit for Religion 34.230.
Lecture three hours a week.

Religion 34.231 ★

Selected Topics in the Study of Mysticism

Contents of this course may vary from year to year.
Lecture three hours a week.

Religion 34.235

Religion and Contemporary Moral Issues

The nature of religious ethics, both the explicit moral principles and rules of various religious traditions, and the general moral perspectives. A selection of contemporary moral issues examined in depth.

Prerequisite: Other Religion course or permission of the Department.

Lecture three hours a week.

Religion 34.237 ★

Selected Topics in Religion

Contents of this course vary from year to year.
Lecture three hours a week.

Religion 34.238 ★

Death and Afterlife

The meaning of death and afterlife in some religious traditions and secular philosophies with emphasis on the Hindu teaching of the immortal soul; the Hebraic idea of collective survival; the Christian doctrine of resurrection of the body; the Buddhist conception of no-soul and nirvana.

Lecture three hours a week.

Religion 34.243

Religion and Society

Cross-cultural survey of religious institutions, with attention to theories and methodologies in the study of religion. Topics include myth, totemism, cults, ritual, altered states of consciousness, and the relationship of religion to other social institutions and processes. (Also listed as Sociology-Anthropology 56.243.)

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, or permission of the Department.

Lecture three hours a week.

Religion 34.257 ★

Christianity

The range of Christian thought and history from the time of Jesus to the present.

Precludes additional credit for Religion 34.107 ★.

Lecture three hours a week.

Religion 34.258 ★

Introduction to Judaism and the Jewish People

The history of Judaism and the Jewish people from the Second Temple until the present day. The organization, basic beliefs, social and ethical practices of the Jews and Judaism.

Precludes additional credit for Religion 34.108 ★.

Lecture three hours a week.

Religion 34.259 ★

Introduction to Islam

An introduction to the Muslim religious tradition and investigation of its organization, basic beliefs, social and ethical principles and practices.

Precludes additional credit for Religion 34.109 ★.

Lecture three hours a week.

Religion 34.261 ★

Philosophy of Religion

A philosophical examination of some characteristic concepts of religion, such as faith, hope, worship, revelation, miracle, God. (Also listed as Philosophy 32.261 ★.)

Prerequisite: A course in Philosophy or Second-year standing.

Lecture three hours a week.

Religion 34.271 ★

Judaism and the Jewish People: The Early Period

A study of the history of Judaism and the Jewish people from the Maccabees to the Rabbinic Age. Attention is given to the rise of sectarian movements (Pharisees, Saducees and Qumran Covenanters), the rise of Christianity, revolutionaries such as the Zealots and Bar Kochba, the Jewish responses to Hellenism, the reshaping of Judaism after the destruction of the Second Temple, and Rabbinic Judaism in Palestine and the Diaspora.

Lecture two hours a week.

Religion 34.272 ★

Islam in the Modern World

An examination of Islam in the last two hundred years, including the nature of the Islamic resurgence and the new forms of Islamic vitality.

Precludes additional credit for Religion 34.274.

Lecture three hours a week.

Religion 34.278

The Middle East: 1798 to the Present

The history of the development of the civilization and culture of the Middle East from 1798 to the present with special emphasis on the mutual discovery of East and West, the search for identity, the impact of colonialism and international rivalry, and social, religious and cultural change within a continuing tradition. (Also listed as History 24.278.)

Lecture two hours a week.

Religion 34.303 ★

Paul Tillich and the Divine-Human Relation

The course examines Tillich's conception of God as Ground of Being and Depth of Reason, drawing on selections from his essays, lesser works and Systematic Theology.

Precludes additional credit for Religion 34.306.

Lecture three hours a week.

Religion 34.304 ★

Teilhard de Chardin: Christianity and Evolution

The course examines Teilhard's correlation of a Christian with an evolutionary perspective from his early writings (First World War)

Religion

through to his late synoptic essays.
Precludes additional credit for Religion 34.306.
Lecture three hours a week.

Religion 34.305 ★

C.G. Jung and the Psychology of Religion

The course examines Jung's major statements in the Collected Works about the psychogenesis of religion and the implications this has for the understanding of humanity as religious.
Precludes additional credit for Religion 34.306.
Lecture three hours a week.

Religion 34.320 ★

Selected Topics in Indian Thought

Contents of this course vary from year to year.
Prerequisite: One course in Buddhism.
Lecture three hours a week.

Religion 34.325 ★

Selected Topics of Women in Religion

Descriptive and critical analysis of perspectives on women, sex, and gender in selected religious traditions. Contents of this course may vary from year to year.
Prerequisite: Second-year standing or higher.
Lecture three hours a week.

Religion 34.328

The Life and Teaching of Jesus

A systematic study of the available records of the life of Jesus. Lectures, readings and discussions on the historical context of the life of Jesus and on the milieu within which the records developed.
Precludes additional credit for Religion 34.225.
Lecture three hours a week.

Religion 34.330

The Life and Thought of Paul

Paul's relation to the Old Testament, Rabbinic Judaism, and Hellenism; the mission to the Gentiles; the "mysticism" of Paul; central ideas such as justification by faith, predestination, the Holy Spirit, the Church. Consideration of the situation and message of each of Paul's writings.
Prerequisite: Second-year standing or higher.
Lecture three hours a week.

Religion 34.331 ★

Theory and Method in the Study of Religion

Examination of selected theoretical and methodological models used in the interpretation of religious data. Contents of this course vary from year to year.
Prerequisite: Second-year standing or higher.
Lecture two hours a week.

Religion 34.332 ★

Studies on Christianity

Selected problems in the study of the Christian religion.
Prerequisite: One course in Religion.
Lecture three hours a week.

Religion 34.336 ★

Selected Topics in Religion

Contents of this course may vary from year to year.
Prerequisite: Second-year standing or higher.
Lecture three hours a week.

Religion 34.338 ★

Selected Topics in Early Christian History

Contents of this course vary from year to year.
Prerequisite: Second-year standing or higher.
Lecture three hours a week.

Religion 34.342 ★

Selected Topics in Islam

Contents of this course vary from year to year.
Prerequisite: Second-year standing or higher.
Lecture three hours a week.

Religion 34.355 ★

Selected Topics in Judaism and Jewish History

Topic for 1999-2000: Modern Israel. Examination of modern Israel, its origins, state, society and culture. Special emphasis is placed on Israel's different ethnic, cultural and religious communities, and their relationships with communities and states outside the country.
Prerequisite: Second-year standing or higher.
Seminar three hours a week.

Religion 34.365 ★

Historic Figures in the Psychology of Religion

Discussion of religiously significant texts from the works of William James, Sigmund Freud and C.G. Jung.
Precludes additional credit for Religion 34.265 ★.
Prerequisite: Second-year standing or permission of the Discipline.
Lecture three hours a week.

Religion 34.366 ★

Contemporary Psychologies of Religion

An examination of developmental, experimental, humanistic and existential theories in psychology as these shed light on religious thought, behaviour and institutions.
Precludes additional credit for Religion 34.266 ★.
Prerequisite: Second-year standing or permission of the Discipline.
Lecture three hours a week.

Religion 34.370

The Development of Christian Thought

Historical and cultural development of selected aspects of Christian thought from its origins to the modern period. Cultural shifts, doctrines of God and Christ, the church as an institution; conciliarism and reform; the Protestant Reformation and its aftermath.
Precludes additional credit for Religion 34.270.
Prerequisite: Second-year standing.
Lecture three hours a week.

Religion 34.378 ★

Reformation Europe

A history of the Protestant and Catholic Reformations of the sixteenth century, with special emphasis on the theological disputes of the protagonists and the impact of these disputes on the social, political and cultural developments of the era. (Also listed as History 24.378 ★.)
Prerequisite: A 200-level History course.
Lecture three hours a week.

Religion 34.380

Modern Religious Thought

An examination of the major currents and developments of religious and philosophical thought among Protestants and Catholics in the nineteenth and twentieth centuries. Protestant developments are traced from the Kantian critique to the present and Catholic thought from its response to the French Revolution up to and beyond Vatican II.
Precludes additional credit for Religion 34.280.
Prerequisite: One course in Religion or Philosophy.
Lecture three hours a week.

Religion 34.390

Selected Problems in Interpretation

A course conducted on a tutorial or seminar basis designed to enable advanced students to pursue interests in selected areas of religion.

Prerequisite: Permission of the Discipline.
Tutorial/seminar three hours a week.

Religion 34.391 ★

Selected Problems in Interpretation

A course conducted on a tutorial or seminar basis designed to enable advanced students to pursue interests in selected areas of religion.

Prerequisite: Permission of the Discipline.
Tutorial/seminar three hours a week.

Religion 34.480 ★

Topics in Religious Studies

A seminar on a topic in religious studies. The topic will vary from year to year. Topic for 1999-2000: Theories of the Psychogenesis of Religious and Mystical Experience in James, Freud, and Jung. The course will examine Jung's appropriation of certain Christian mystics: the Beguines, Meister Eckhart, Jacob Boehme and their influence on aspects of German idealism, especially Hegel.

Prerequisite: Third-year standing in B.A. (Honours) or Combined B.A. (Honours) in Religion.
Seminar three hours a week.

Religion 34.481 ★

Tutorial

A tutorial on a topic in religious studies. Contents of the tutorial to be arranged with the supervising faculty member.

Prerequisite: Third-year standing in B.A. (Honours) or Combined B.A. (Honours) in Religion.

Religion 34.498 (2.0 credits)

Honours Essay

A written proposal in consultation with a Program Director, consisting of title, outline and bibliography must be submitted to and approved by the Honours Essay Proposal Board. The essay of approximately 16,000 words, is jointly evaluated on its completion by the Departmental Director and one other member of the department.

Precludes additional credit for Religion 34.499. (Consult Departmental Document for further details.)

Prerequisite: Fourth-year standing in Religion and permission of the Discipline.

Seminar three hours a week.

Religion 34.499

Honours Essay

A written proposal in consultation with a Program Director, consisting of title, outline and bibliography must be submitted to and approved by the Honours Essay Proposal Board. The essay of approximately 10,000 words, is jointly evaluated on its completion by the Departmental Director and one other member of the department. (1.0 credit)

Precludes additional credit for Religion 34.498. (Consult Departmental Document for further details.)

Prerequisite: Fourth-year standing in Combined Honours in Religion and permission of the Discipline.

Seminar three hours a week.

Language Courses

Language courses are intended for students specializing in a particular religious tradition. They are offered according to the availability of members of the Discipline. Courses taken at the 200-level or above will be mainly independent study under the supervision of a member of the Discipline. Students interested in taking these courses should consult the Co-ordinator.

Religion 34.192

Elementary Language Tutorial

Elementary study of the language required for studying a religious tradition. Restricted to students registered in a Religion program. Tutorial two hours a week.

Religion 34.292

Intermediate Language Tutorial

Intermediate study of the language required for studying a religious tradition. Restricted to students registered in a Religion program.

Prerequisite: Religion 34.192 or permission of the Discipline.
Tutorial two hours a week.

Religion 34.392

Advanced Language Tutorial

Advanced study of the language required for studying a religious tradition. Restricted to students registered in a Religion program.

Prerequisite: Religion 34.292 or permission of the Discipline.
Tutorial two hours a week.

School of Languages, Literatures and Comparative Literary Studies

Russian

(Arts and Social Sciences)

1416 Dunton Tower
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Teaching Staff

Professor

Glynn Barratt, M.A.(Cantab.), Ph.D.(London), F.R.A.S., F.R.Hist.S.

Adjunct Professors

A. Lewinson • P. Varnai

General Information

Students currently enrolled in degree programs offered by the Discipline of Russian are governed by the requirements contained in the 1997-98 Undergraduate Calendar.

Minor in Russian

A Minor in Russian requires 4.0 credits in Russian, with a GPA of 4.0 or better, including:

36.100, 36.202 (36.120 may be taken in place of 36.100 and 36.202), 36.302, 36.203, or 36.307 ★ and 36.308 ★.

At least 2.0 credits in the Minor must be completed at Carleton.

Requirement for Breadth, for students in B.A. or B.A.(Honours) degrees

Category for Breadth	Courses in this unit
The temporal dimension of human societies, analyzing times before the present era or societies other than our own	
The artifacts of the imagination in literature and/or other forms, or that addresses the life of the imagination and culture.	
The understanding of social, technological and/or natural processes and the ways in which that understanding is obtained in science and social science.	All courses in Russian
Matters of human values, ethics and social responsibilities	

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Russian 36.100

Introductory Russian

Basic skills in oral comprehension and an adequate grasp of the mechanics of the language. Oral practice in the language laboratory. Compulsory attendance for both lecture and laboratory work.

Precludes additional credit for Russian 36.120.

Lecture four hours a week, laboratory one hour a week.

Russian 36.120

Intensive Russian

Compressed two-year study of the Russian language. Provides a rapid and thorough grounding in how to read, write and speak Russian. No auditors.

Precludes additional credit for Russian 36.100 and 36.202.

Lecture seven hours a week, laboratory one hour a week.

Russian 36.201 ★

Spoken Russian

Oral practice of vocabulary to enable students to handle a range of everyday topics and social situations, and to produce simple narration or description.

Prerequisite: Russian 36.100 or permission of the School.

Note: It is recommended that the course is to be taken concurrently with Russian 36.202 (Intermediate Russian) or after its completion.

Lecture three hours a week.

Russian 36.202

Intermediate Russian

Grammar studies, reading and listening comprehension, and conversation. Compulsory attendance for both lectures and laboratory.

Precludes additional credit for Russian 36.120 and 36.220.

Prerequisite: Russian 36.100 or permission of the School.

Lecture three hours a week, laboratory one hour a week.

Russian 36.203

Russian Grammar

A systematic review of Russian grammar, taught in English. Word formation, and morphology, with special emphasis on the most difficult parts of Russian grammar for non-Russians.

Prerequisite: A grade of C or better in Russian 36.100 or permission of the School.

Note: It is recommended that the course be taken concurrently with Russian 36.202 (Intermediate Russian), or after its completion.

Lecture three hours a week.

Russian 36.205 ★

Written Russian

A sequel to Russian 36.201 ★ emphasizing comprehension and self-expression in written Russian.

Prerequisite: Russian 36.201 ★ or permission of the School.

Note: It is recommended that this course be taken concurrently with Russian 36.202 (Intermediate Russian), or after its completion.

Lecture three hours a week.

Russian 36.220

Business Russian

Acquisition of basic grammatical knowledge, comprehension and minimal vocabulary for Russian business language. Reading and writing material based on language of business and commerce. Precludes additional credit for Russian 36.120 and 36.202. Prerequisite: Russian 36.100 or permission of the School. Lecture three hours a week, laboratory one hour a week.

Russian 36.260

**Russian Literature in English Translation C
Nineteenth and Twentieth Centuries**

Selected works of Russian literature in the context of European literature and against their social and political backgrounds. Includes works by Pushkin, Gogol, Turgenev, Leo Tolstoy, Dostoevsky, Chekhov, Gorky, Bulgakov, Pasternak, Solzhenitsyn. Lecture two hours a week.

Russian 36.301 ★

Advanced Spoken Russian

A sequel to Russian 36.201 ★. Prerequisite: Russian 36.201 ★ or permission of the School. Lecture three hours a week.

Russian 36.302

Advanced Russian

Continuation of the basic Russian sequence. Introduction to prose composition and essay writing; further development of comprehension and self-expression in Russian. Compulsory attendance. Prerequisite: Russian 36.120 or 36.202 or permission of the School. Lecture three hours a week.

Russian 36.305 ★

Advanced Written Russian

A sequel to Russian 36.205 ★. Composition and essay writing in Russian. Prerequisites: Russian 36.202, 36.205 ★ and 36.301 ★, or permission of the School. Lecture three hours a week.

Russian 36.307 ★

Russian Syntax

Fundamental concepts of Russian syntax (parts of the sentence, types of sentences, types of clauses etc.) with extensive exercises. Precludes additional credit for Russian 36.303. Prerequisite: Russian 36.202 and 36.203 or permission of the School. Lecture three hours a week.

Russian 36.308 ★

Russian Translation

Principles and practice of translation of literary and non-literary texts from Russian to English. Precludes additional credit for Russian 36.303. Prerequisite: Russian 36.307 ★ or permission of the School. Lecture three hours a week.

Russian 36.407

Major Authors: Pushkin to Chekhov

Selected texts in Russian from major authors of the nineteenth century: Pushkin, Gogol, Turgenev, Dostoevsky, Tolstoy, Chekhov. Reading literary texts in historical context; artistic developments in poetry and fiction throughout the period. Precludes additional credit for Russian 36.335. Prerequisites: A Russian course at the 300-level and permission of the School. Tutorial.

Russian 36.409

Major Authors: Gorky to Solzhenitsyn

A study of selected texts in Russian from authors of the twentieth century such as Gorky, Babel, Blok, Mayakovsky, Bulgakov, Zamyatin, Sholokhov and Solzhenitsyn. Emphasis is placed on

the reading of literary texts in the context of political and social change and on the study of literary trends, themes and experiments.

Precludes additional credit for Russian 36.355.

Prerequisites: A Russian course at the 300-level and permission of the School.

Russian 36.410 ★

Russian Style and Composition I

Introduction to stylistics and expressive writing. Analysis of semantic and structural peculiarities of modern Russian. No auditors.

Precludes additional credit for Russian 36.304 and 36.404.

Prerequisites: Russian 36.302 and permission of the School.

Russian 36.411 ★

Russian Style and Composition II.

A continuation of Russian 36.410 ★. No auditors.

Precludes additional credit for Russian 36.304 and 36.404.

Prerequisites: Russian 36.410 ★ and permission of the School.

Russian 36.420 ★

Russian for International Relations I

Reading, translation, discussion and writing in Russian of documents, reports and articles. Readings from the Russian Press are studied to provide insights into political and commercial relations between Canada and Russia. No auditors.

Precludes additional credit for Russian 36.320 ★.

Prerequisites: Russian 36.302, 36.307 ★ and 36.308 ★ or permission of the School.

Lecture three hours a week.

Russian 36.421 ★

Russian for International Relations II

A continuation of Russian 36.420 ★. No auditors.

Precludes additional credit for Russian 36.321 ★.

Prerequisite: Russian 36.420 ★ or permission of the School.

Lecture three hours a week.

Russian 36.435 ★

Tutorial: Special Topic (Literature)

A tutorial offering advanced study of a literary topic in the area of literary history, criticism or theory, to be arranged in consultation with a member of Russian. No auditors.

Prerequisites: A Russian course at the 300-level and permission of the School.

Tutorial.

Russian 36.455

Tutorial: Special Topic (Post-1917 Period)

A tutorial offering study of a topic related to the literature of the Revolution and after, to be arranged in consultation with a member of Russian. No auditors.

Prerequisites: A Russian course at the 300-level and permission of the School.

Russian 36.493 ★

Translation Tutorial I

This course is intended for students in the Institute of Central/East European and Russian-Area Studies, although other students may enrol with the permission of Russian. It offers work in translation to and from Russian, and the objectives of the course are co-ordinated with the specific needs of students in the Institute. No auditors.

Prerequisites: A 300-level Russian language course or equivalent and permission of the School.

Russian 36.494 ★

Translation Tutorial II

A continuation of Russian 36.493 ★. No auditors.

Prerequisites: Russian 36.493 ★ and permission of the School.

Russian

Russian 36.495 ★

Tutorial: Special Topic (Language)

A tutorial on topics of language or linguistics, providing individual or small group study. For students in the Translation Option, it will be a practicum in translation with analysis and criticism of selected professional translations. No auditors.

Prerequisites: Russian 36.302 or 36.307 ★ and 36.308 ★ and permission of the School.

Russian 36.496 ★

Tutorial: Special Subject

A tutorial on a selected literary or language topic, providing individual or small group study. No auditors.

Prerequisites: A Russian course at the 400-level and permission of the School.

Russian 36.499

Honours Research Project

Independent research and writing under the supervision of a member of the discipline. Open to students in the Fourth year of Honours. Written assignment for the course is a piece of work of approximately 8,000 words.

Social Work

(Public Affairs and Management)

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Professors

Allan S. Moscovitch, B.A. (Carleton), M.A. (Essex) • **Gillian Walker**, B.A., M.S.W. (British Columbia), Ph.D. (Toronto)

Associate Professors

Hugh Armstrong, B.A., M.A. (Carleton), Ph.D. (Montréal) • **Colleen Lundy**, B.Sc. (Ottawa), M.S.W. (Carleton), Ph.D. (Florida State) • **Gerald de Montigny**, B.A. (British Columbia), M.S.W. (Toronto), M.A., Ph.D. (O.I.S.E.) • **Diana Ralph**, B.A. (Wayne State), M.S.W. (Columbia), M.A., Ph.D. (Regina) • **Elizabeth Whitmore**, B.A., M.S.W. (Boston), Ph.D. (Cornell)

Assistant Professors

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Instructors

Linda Advokaat, B.A. (U. of California), M.A., (Carleton) • **Rheal Brant-Hall**, B.S.W. (Victoria) • **Shirley Judge**, Testamur in Social Studies (Bristol) • **Rashmi Luther**, B.A., M.S.W. (Carleton) • **Cecilia Taiana**, B.A. (Catholic University, Buenos Aires), M.Ed. (Ottawa) • **Martha Wiebe**, B.A. (Saskatchewan), M.A. (Waterloo Lutheran)

Adjunct Professors

S. James Albert • **Peter Findlay** • **K.A. Fuerst** • **Helen Levine** • **Edith E. Moore**

General Information

The Bachelor of Social Work Honours program combines a Liberal Arts education with professional preparation. The primary objective of the program is to provide students with the knowledge and skills necessary to begin entry level practice in Social Work.

The School's orientation places a strong emphasis on sensitivity to the individual and on the development of innovative strategies for working with people both individually and collectively. The School also stresses an awareness of and a capacity for analysis of the social policies and administrative practices that affect the lives of many people in our society. Analyses of class, gender and race relations are considered central to the program. The program's core courses and field practice are structured so that students develop first a broad understanding of societal forces as well as skills in direct practice, social administration and policy.

The Carleton School of Social Work is committed to Educational Equity. The society in which we live and of which Social Work is a constituent part, is composed of people distinguished by their differential access to power—economic, political, and social. The School affirms the principle that all people should have the opportunity to learn in a supportive environment. Educational Equity applies, but is not limited to persons of aboriginal and racial, cultural, and/or ethnic minority origin; persons with disabilities; lesbian, gay and bisexual persons; and persons disadvantaged by their gender or economic position. Educational equity is consistent with a continuing commitment to meeting high standards of academic practice competence.

Educational Equity provides for Social Work education to people who otherwise might not have such an opportunity. It also brings

into Social Work students whose life experiences enable them to challenge the accepted structure of Social Work itself.

Admission Requirements

This Calendar specifies the general conditions of entry that apply to all undergraduate programs.

For admission to First year of Social Work, there are two components:

1. The OSSD or the equivalent, with an average of 65 percent or better, including six OACs or the successful completion of Qualifying-University year.
2. Preference will be given to applicants with a minimum of one year Human service experience. Human service work may be met by employment and/or volunteer activities. Each applicant is requested to complete a personal data information document, which will assist in the evaluation of their suitability for the program.

Consideration may be extended to other applicants under Mature Applicant regulations.

The number of student spaces in the School is limited; therefore, it may not be possible to grant admission to all applicants who meet the foregoing requirements.

Students who meet the Faculty Honours continuation standards will be considered for transfer into the Second year of the B.S.W. program when spaces are available.

Students who have completed an undergraduate degree are normally admitted into the program with Third-year standing. Students with Third-year standing are eligible to take Social Work 52.300.

Residence Requirements

Students transferring from other institutions with advanced standing in Social Work must complete a minimum of 7.5 credits in the School of Social Work chosen from the core courses in years 3 and 4, and to include Social Work 52.460.

Equity Admissions

In the context of the admissions policy of Carleton University, the School of Social Work has an equity admissions policy that applies to candidates from groups that have been disadvantaged in respect to access to many social institutions in Canadian society. Educational Equity applies to, but is not limited to, persons of aboriginal and racial, cultural, and/or ethnic minority origin; persons with disabilities; lesbian, gay and bisexual persons; and persons disadvantaged by their gender or economic position.

All students are required to meet the School of Social Work continuation standards and graduation requirements.

Work Experience and Credit for Field Practice I (52.360)

On admission to the B.S.W. program, students who have four or more years of human service may apply to the B.S.W. Field Coordinator for waiver of the requirement for Social Work 52.360. If successful, they will be granted 1.0 elective credit in Social Work and will be required to take 1.0 additional elective credit in Social Work in lieu of Social Work 52.360. Applications must be received by September 1 of each year.

Challenge for Credit

The School of Social Work accepts challenge for credit on elective courses in the B.S.W. program (except for 52.309 ★, 52.429 ★, 52.490 ★ and 52.492 ★). Challenge for credit is not accepted for required B.S.W. courses. (See p. 67, Challenge for Credit.)

Graduate Program

The School of Social Work offers studies leading to the degree of Master of Social Work (M.S.W.). For details of this program consult the School and the Calendar of the Faculty of Graduate Studies and Research.

Honours Program

Candidates whose first degree will be the Bachelor of Social Work take a total of 20.0 credits, a minimum of 9.5 Social Work credits and a minimum of 8.0 credits taken from outside the School of Social Work.

The School requirements for this degree are:

1. Social Work 52.100; 52.200, 52.210 ★; 52.310 ★, 52.320 ★, 52.321 ★; and 52.420 ★;
2. Social Work 52.360 (2.0 credits), 52.460 (2.0 credits) or 52.461 and 52.462;
3. Social Work options, either 52.498 or two 0.5 credit courses in Social Work to be completed at the 400-level or higher;
4. a minimum of 8.0 credits outside the School of Social Work to include 1.0 credit in Psychology, and 1.0 credit in Sociology;
5. 1.0 credit of Research is required. Social Work 52.250 is recommended. 1.0 credit in another approved research course may be substituted.
6. 1.5 additional credits may be either Social Work options or electives outside the School;

Candidates for the B.S.W. who enter the program with Third-year Honours standing may be exempted from Social Work 52.100 and 52.200 only. However, they must normally obtain credit for Social Work 52.300 and all other required Social Work courses listed above.

Continuation of the B.S.W. Honours program requires that a student meet the relevant Faculty regulations (see p. 74).

Graduation from the B.S.W. Honours program requires a GPA of 6.5 or better over all graded Social Work courses counted towards the degree.

Students are strongly advised to consult with their faculty adviser and the Supervisor of Undergraduate Studies regularly throughout their degree studies to ensure that they are observing School and University requirements.

Off-Campus Program

Bachelor of Social Work in First Nations Communities

The School of Social Work is involved in the presentation of the undergraduate degree programs on location in First Nations communities. All of the programs have been developed as a result of discussions initiated by the communities themselves. The School has responded to these requests, setting up BSW programs over the past 6 years at several sites in Ontario and Quebec. Out of these experiences both the School and the University have learned a great deal about working collaboratively with First Nations communities. The School is currently involved in partnerships with the First Nations Technical Institute located at Tyendinaga in Eastern Ontario, with the Rainy Lake Ojibway Education Authority (RLOEA) located in Northwestern Ontario and with Akwesasne located on the St. Lawrence River, in both Ontario and Quebec.

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Social Work 52.100

Introduction to Social Work and Social Welfare

Social work practice, principles and knowledge base, current social problems and related fields of practice. Analysis of the relationship between social welfare and Canadian society, and the interrelationship among social work practice, societal change, social problems and social programs.

Lecture three hours a week.

Social Work 52.200

Structural Analysis and Social Work

Establishes framework for the utilization of social science theory in social work practice. Contributions from psychology, social, political and economic theory in contexts of race, gender and class.

Prerequisites: Honours standing in the B.S.W. program and Social Work 52.100; or permission of the School.

Lecture three hours a week.

Social Work 52.202 ★

Social Control and Deviance in Social Work

Theories of deviance and the structural contexts of deviant labeling and social control are explored in the context of social work practice. Students explore the implications of stigma in their lives and in the lives of those they serve.

Prerequisite: Social Work 52.100; or 52.300 (which may be taken concurrently); or permission of the School of Social Work.

Lecture three hours a week.

Social Work 52.203 ★

Drugs in Society: Theory, Policy and Practice

An examination of the extent and nature of alcohol and other drug use, theoretical explanations of drug dependence, history of drug policy development and current federal and provincial drug strategies. Strategies for social work practice are outlined.

Prerequisite: Social Work 52.100; or 52.300 (which may be taken concurrently); or permission of the School of Social Work.

Lecture three hours a week.

Social Work 52.204 ★

Human Sexuality

Psychosocial and political issues surrounding human sexuality. The influence of culture; the range of individual differences in sexual and reproductive attitudes, values and behaviour; concerns of various sexually oppressed groups; sexual values and norms and social policy affecting sexual behaviour; implications for social work practice.

Prerequisite: Social Work 52.100; or 52.300 (which may be taken concurrently); or permission of the School.

Lecture three hours a week.

Social Work 52.210 ★

The Political Economy of Social Welfare

History and theories of welfare. Contemporary issues such as the nature of the labour market, the family, the voluntary sector, and the state as the institutions through which welfare is provided in contemporary society.

Prerequisites: Honours standing in the B.S.W. program and Social Work 52.100; or permission of the School.

Lecture three hours a week.

Social Work 52.211 ★

Poverty and Social Policy

Studies of poverty and the distribution of income and wealth in Canada; origins and persistence of inequality of income and wealth; social policies and poverty.

Prerequisite: Social Work 52.100; or 52.300 (which may be taken concurrently); or permission of the School.

Lecture three hours a week.

Social Work 52.212 ★

Housing Policy

Introduction to modes of analysis of housing and policy; current Canadian housing programs and policies; contemporary issues in policy analysis.

Prerequisite: Social Work 52.100; or 52.300 (which may be taken concurrently); or permission of the School.

Lecture three hours a week.

Social Work 52.221 ★

Working with Children and Youth

Preventative and protective social work intervention with children and youth. Problems of child neglect, abuse and violence in the context of family, organizational mandate and social political contexts. Programs and services for children and youth.

Prerequisite: Social Work 52.100; or 52.300 (which may be taken concurrently); or permission of the School.

Lecture three hours a week.

Social Work 52.250

Research Methods in Social Work

A range of research methods designs, including quantitative and qualitative. Alternative paradigms include: participatory, feminist, community based.

Prerequisite: Social Work 52.100; or 52.300 (which may be taken concurrently); or permission of the School.

Lectures three hours a week.

Social Work 52.300

Foundations of Structural Analysis, Social Welfare and Social Work

Social work, social welfare policy and social services in Canada. Interactions between personal and social problems, political and state organization, households, and the economy.

Precludes additional credit for Social Work 52.100, and 52.200.

Prerequisites: Third-year Honours standing upon admission to the B.S.W. and permission of the School.

Lecture three hours a week.

Social Work 52.309 ★

Special Topics in Social Work

Theory, policy or direct practice that is not ordinarily treated in the regular course program. Choice of topics varies from year to year and is announced well in advance.

Prerequisite: Third-year Honours standing; Social Work 52.100; or 52.300 (which may be taken concurrently); or permission of the School.

Lecture three hours a week.

Social Work 52.310 ★

Social Administration and Policy

Administration, management, social research and planning. Theory and practice of the welfare state and social policy; structure and management of major social programs; social administration as a form of social work practice.

Prerequisite: Honours standing in the B.S.W. Program; Social Work 52.100, 52.200 or 52.300 and 52.210 or permission of the School.

52.300 may be taken concurrently.

Lecture three hours a week.

Social Work 52.311 ★

Race and Social Policy

Theories of racism; race analysis of social welfare issues and social policy; and racism in Canadian society and specifically in the welfare state; racism in the history of Canadian welfare state.

Prerequisite: Social Work 52.100; or 52.300 (which may be taken concurrently); or permission of the School.

Lecture three hours a week.

Social Work 52.313 ★

Group Processes in Social Psychology

In-depth coverage of one or more sub-areas of social psychology introduced in Psychology 49.210 ★. Topics may include interaction in the dyad, coalition formation in larger groups, history and theory of small group research, North America, West-European and East-European models of groups behaviour, and training groups in industry. (Also listed as Psychology 49.313 ★).

Prerequisite: Psychology 49.210 ★ or permission of the School.

Lecture three hours a week.

Social Work 52.319 ★

Special Topics in Social Work

Theory, policy or direct practice that is not ordinarily treated in the regular course program. Choice of topics varies from year to year and is announced in advance of registration.

Prerequisite: Third-year Honours standing; Social Work 52.100; or 52.300 (which may be taken concurrently); or permission of the School.

Lecture three hours a week.

Social Work 52.320 ★

Social Work Practice in Communities and Organizations

Major theories and practices pertaining to work in communities and human service organizations. Society's contribution to client problems and the impact of agency structures on services. Social change theories and methods for social work practitioners.

Prerequisites: Honours standing in the B.S.W. program; Social Work 52.100, 52.200, or 52.300 and 52.210 ★; or permission of the School.

Social Work 52.300 and 52.360 are normally taken concurrently.

Lecture three hours a week.

Social Work 52.321 ★

Social Work Practice: Individuals, Families and Groups

Development of practice competency in work with individuals, families and groups. Integration of interpersonal and analytic skills in learning effective strategies within a structural framework. Influence of class, race and gender in shaping personal and social well-being.

Prerequisites: Honours standing in the B.S.W. program, Social Work 52.100, 52.200, or 52.300 and 52.210 ★; or permission of the School. 52.300 and 52.360 are normally taken concurrently.

Lecture three hours a week.

Social Work 52.322 ★

Practice Skills in Social Work

Practice of specific analytical and intervention skills needed for structural Social Work.

Precludes additional credit for Social Work 52.222 ★.

Prerequisite: Social Work 52.100; or 52.300 (which may be taken concurrently); or permission of the School.

Lecture three hours a week.

Social Work 52.324 ★

Models of Practice with Individuals and Families

Contemporary models of social work practice. The strengths and limitations of each model, as well as issues, questions and problems relating to practice.

Prerequisite: Social Work 52.100; or 52.300 (which may be taken concurrently); or permission of the School.

Lecture three hours a week.

Social Work 52.325 ★

Strategies of Community Change

Models and methods of grass-roots organizing for social change. Studying and working with community groups, students learn strategic planning, organizing, and evaluation skills.

Prerequisite: Social Work 52.100; or 52.300 (which may be taken concurrently); or permission of the School.

Lecture three hours a week.

Social Work 52.326 ★

Community Development and Social Change

Introduction to theories, models and methods of grassroots organizing for social change and development; theory and practice of community development as a strategy for social change; models and methods of community organizing; development of a personal approach to ground community organizing practice.

Prerequisites: Public Affairs and Policy Management 58.200 or Social Work 52.100 or 52.300 (which may be taken concurrently); or permission of the School.

Lecture three hours a week.

Social Work 52.351 ★

Statistics for Social Workers

Concepts and applications of descriptive and inferential statistics relevant to the problems encountered by social workers and other human service practitioners. Selection and utilization of statistical methods in policy making and program development.

Prerequisites: Social Work 52.100; or 52.300; and 52.250; or permission of the School.

Lecture three hours a week.

Social Work 52.352 ★

Qualitative Research Methods in Social Work

Introduction to qualitative research. How to gather data that exists in terms of lived experience thickly embedded in the historical, interactional, emotional and relational worlds of everyday life. Draws on strategies from feminist research, participatory and social action research, phenomenological research and makes application to social work practice.

Prerequisites: Social Work 52.100; or 52.300, and 52.250 or equivalent; or permission of the School of Social Work.

Lecture three hours a week.

Social Work 52.360 (2.0 credits)

Field Practice I

Focus on integrating theory and practice in a community setting supervised by a field supervisor. Monthly seminar included. Graded as *Sat/Uns*.

Prerequisites: Honours standing in the B.S.W. and concurrent enrolment in Social Work 52.320 ★ or 52.321 ★ in the Fall term and 52.320 ★ or 52.321 ★ in the Winter term, and permission of the School.

364 hours of field work over two terms.

Social Work 52.412 ★

Aboriginal Peoples and Social Policy

Social welfare issues from an Aboriginal perspective (Canadian, international), including child welfare, racism, justice, violence against women and children, substance abuse. Policy issues within a historical and contemporary social, political and economic context. Implications of self-determination for Aboriginal social policy and programs.

Precludes additional credit for Social Work 52.312 ★.

Prerequisite: Third-year Honours standing, Social Work 52.100; or 52.300 (which may be taken concurrently); or permission of the School.

Lecture three hours a week.

Social Work 52.413 ★

Practice and Policy in Immigration

Canadian immigration policies and practices. The historical context of immigration policies; direct practice with immigrants and refugees; settlement and integration issues; immigrants and refugee women; intergenerational family relations; resources and community organizing.

Prerequisite: Third-year Honours standing, Social Work 52.100; or 52.300 (which may be taken concurrently); or permission of the School.

Lecture three hours a week.

Social Work 52.414 ★

International Themes in Social Work and Social Welfare

Social welfare policy development with a focus on the Third World. Social policies and practices are examined in relation to the needs of the people and the problems inherent in North American models. Precludes additional credit for Social Work 52.314 ★.

Prerequisite: Third-year Honours standing, Social Work 52.100; or 52.300 (which may be taken concurrently); or permission of the School.

Lecture three hours a week.

Social Work 52.415 ★

Management of Non-Profit Organizations

Introduction to theories, models and methods of managing non-profit organizations; role, nature and values of the non-profit sector in a market society; practical knowledge of management in different types of non-profit organizations (e.g. cooperatives, voluntary associations, public advocacy and community service organizations).

Prerequisites: Public Affairs and Policy Management 58.300; or Social Work 52.210 ★ and 52.310 ★ (which may be taken concurrently).

Lecture three hours a week.

Social Work 52.420 ★

Honours Integrative Seminar

Designed to help students to arrive at a synthesis of theory and practice, and to develop skills of critical self evaluation.

Prerequisites: Fourth-year Honours standing in the B.S.W. program; Social Work 52.210 ★, 52.310 ★, 52.320 ★, 52.321 ★, 52.360 and 52.460, or 52.461 and 52.462.

Lecture three hours a week.

Social Work 52.422 ★

AIDS: Policy, Programs and Practice

Personal, social and political aspects of Acquired Immune Deficiency Syndrome. Knowledge, skills and values important for social workers in co-ordinating health and social services, program development and political analysis and working in partnership with people living with AIDS.

Prerequisite: Third-year Honours standing, Social Work 52.100; or 52.300 (which may be taken concurrently); or permission of the School.

Lecture three hours a week.

Social Work 52.423 ★

Social Work Practice from an Aboriginal Perspective

Cultural identity of the Original Peoples of Canada, their traditional values, cultural-based behaviour and the effects on them of changing times and relations. Emphasis on culture-specific skills and approaches. Role of the political, legal, and constitutional status of Canadian Aboriginal Peoples.

Prerequisite: Third-year Honours standing, Social Work 52.100; or 52.300 (which may be taken concurrently); or permission of the School of Social Work.

Lecture three hours a week.

Social Work 52.424 ★

Social Work and Aging

Social perspectives on aging with focus on models of practice that contribute to the independence of elderly people. Social programs and policies, such as social insurance, social services, housing, public health and health care. Social, psychological and political issues related to independence in later life.

Prerequisite: Third-year Honours standing, Social Work 52.100; or 52.300 (which may be taken concurrently); or permission of the School of Social Work.

Lecture three hours a week.

Social Work 52.426 ★

Feminist Counselling

Examines theory, practice and literature. Commonalities arising from sexism, racism, class oppression, heterosexism, disability, ageism, etc.

Prerequisite: Social Work 52.321 ★; or permission of the School of Social Work.

Lecture three hours a week.

Social Work 52.429 ★

Special Topics in Social Work

Theory, policy or direct practice that is not ordinarily treated in the regular course program. Choice of topics varies from year to year and is announced in advance of registration.

Prerequisite: Third-year Honours standing; Social Work 52.100; or 52.300 (which may be taken concurrently); or permission of the School.

Lecture three hours a week.

Social Work 52.430 ★

Social Work: Persons with Disabilities

Social work roles in regards to persons with disabilities. Structural analysis of policies and practices pertaining to such persons: cultural, historical, medical, social, political and economic. The disability rights perspective as it opposes the medical model and "ableist" ideals.

Precludes additional credit for Social Work 52.309 (when listed as Social Work with People with Disabilities).

Prerequisite: Third-year Honours standing, Social Work 52.100; or 52.300 (which may be taken concurrently); or permission of the School of Social Work.

Lecture three hours a week.

Social Work 52.460 (2.0 credits)

Field Practice II

Development, application, testing and integration of knowledge, theory and skills in practice with individuals, families groups and communities, in research or in social administration and policy. Graded as *Sat/Uns*.

Precludes additional credit for Social Work 52.461 and 52.462.

Prerequisites: Third-year Honours standing in the B.S.W. program; Social Work 52.210 ★, 52.310 ★, 52.320 ★, 52.321 ★, 52.360; and permission of the School.

364 hours of field work and bi-weekly seminars.

Social Work 52.461

Field Practice II A

Development, application, testing and integration of knowledge, theory and skills in practice with individuals, families, groups and communities, in research or social administration and policy. Graded as *Sat/Uns*.

Precludes additional credit for Social Work 52.460.

Prerequisite: Honours standing in the B.S.W. program, Social Work 52.210 ★, 52.310 ★, 52.320 ★, 52.321 ★, 52.360, and permission of the School.

Social Work 52.462

Field Practice II B

Development, application, testing and integration of knowledge, theory and skills in practice with individuals, families, groups and communities, in research or social administration and policy. Graded as *Sat/Uns*.

Precludes additional credit for Social Work 52.460.

Prerequisites: Honours standing in the B.S.W. program. Social Work 52.210 ★, 52.310 ★, 52.320 ★, 52.321 ★, 52.360, and 52.461; and permission of the School.

Social Work 52.471 ★

Special topic in Criminal Justice and Social Policy

Selected topic in criminal justice and social policy. Topics announced in advance. Part of the Summer School in Criminal Justice and Social Policy and offered by the Department of Law. (Also listed as Law 51.471 ★ and Sociology 53.471 ★).

Prerequisite: Fourth-year Honours standing or permission of the School.

Social Work 52.472 ★

Special topic in Criminal Justice and Social Policy

Selected topic in criminal justice and social policy. Topics announced in advance. Part of the Summer School in Criminal Justice and Social Policy and offered by the Department of Sociology. (Also listed as Law 51.472 ★ and Sociology 53.472 ★).

Prerequisite: Fourth-year Honours standing or permission of the School.

Social Work 52.473 ★

Special topic in Criminal Justice and Social Policy

Selected topic in criminal justice and social policy. Topics announced in advance. Part of the Summer School in Criminal Justice and Social Policy and offered by the School of Social Work. (Also listed as Law 51.473 ★ and Sociology 53.473 ★).

Prerequisite: Fourth-year Honours standing or permission of the School.

Social Work 52.490 ★

Independent Study

A reading or research course for students who wish to investigate a particular topic of interest. Students may take a maximum of 1.0 credit of independent study in their total program.

Prerequisite: Third- or Fourth-year standing in the B.S.W. and permission of the School.

Social Work

Social Work 52.492 ★

Independent Study

A reading or research course for students who wish to investigate a particular topic of interest. Students may take a maximum of 1.0 credit of independent study in their total program.

Prerequisite: Third- or Fourth-year standing in the B.S.W. and permission of the School.

Social Work 52.498

Honours Essay

Research essay undertaken under the supervision of a faculty adviser. The project may take the form of an experiment, a case-study, historical research, or such other work as meets with the adviser's approval. See p. 67 for regulations.

Prerequisites: Third- or Fourth-year Honours standing in the B.S.W. and permission of the School.

Sociology and Anthropology (Arts and Social Sciences)

B742 Loeb Building
Telephone: 520-2582
Fax: 520-4062

Academic Administration

Chair, To be announced

Associate Chair, Brian Given

Associate Chair, Bruce McFarlane

Co-ordinator of Graduate Program (Anthropology),
To be announced

Co-ordinator of Graduate Program (Sociology), Dennis Forcese

Co-ordinator of B.A. (Honours) Program (Anthropology), To be announced

Co-ordinator of B.A. (Honours) Program (Sociology), Karen March

Co-ordinator of B.A. Program, Brian Given

Co-ordinator of Concentration in Power and Everyday Life, To be announced

Co-ordinator of Concentration in Applied Social Research, To be announced

Co-ordinator of Concentration in Population Studies, C. McKie

Teaching Staff

Professors Emeriti

Bruce A. McFarlane, M.A. (McGill), Ph.D. (London) • **Frank G. Vallee,** B.A. (McGill) Ph.D. (London) F.R.S.C.

Professors

Valda J. Blundell, B.A. (George Washington), M.A., Ph.D. (Wisconsin) • **Jacques Chevalier,** B.Ph. (Ottawa), B.A. (Carleton), Ph.D. (Edinburgh) • **Wallace Clement,** B.A. (McMaster), M.A., Ph.D. (Carleton), F.R.S.C. • **John J. Cove,** B.A., M.A. (Dalhousie), Ph.D. (British Columbia) • **Bruce A. Cox,** B.A. (Reed), M.A. (Oregon), Ph.D. (California at Berkeley) • **Bruce Curtis,** B.A. (Queen's), M.A., Ph.D. (Toronto) • **W.S. DeKeseredy,** B.A., M.A., Ph.D. (York) • **John de Vries,** B.A. (Sir George Williams), M.Sc., Ph.D. (Wisconsin) • **Dennis P. Forcese,** M.A. (Manitoba), Ph.D. (Washington at St. Louis) • **A.J. Hunt,** B.A., LL.B., Ph.D. (Leeds) • **Florence J. Kellner,** B.A. (Douglass College), M.A. Ph.D. (Rutgers) • **Charles D. Laughlin,** B.A. (San Francisco), M.A., Ph.D. (Oregon) • **T.A. Nosanchuk,** B.A. (Wayne State), M.A., Ph.D. (Chicago) • **J. Ian Prattis,** B.A. (London), B.Litt. (Oxford), Ph.D. (British Columbia) • **John Shepherd,** B.A., B.Mus. (Carleton), A.R.C.M. (Royal College of Music), D. Phil. (York, U.K.) • **Janet Siltanen,** B.A., M.A. (Waterloo), Ph.D. (Cambridge) • **Daiva K. Stasiulis,** B.A., M.A. (California at San Diego), Ph.D. (Toronto)

Associate Professors

Nahla Abdo, B.A., M.A. (Haifa), M.A., Ph.D. (Toronto) • **Hugh Armstrong,** B.A., M.A. (Carleton), Ph.D. (Montréal) • **Tullio C. Caputo,** B.A., M.A. (Windsor), Ph.D. (Michigan State) • **David Cray,** B.A. (New College), M.S., Ph.D. (Wisconsin) • **Brian J. Given,** B.A., M.A. (Carleton), Ph.D. (Alberta) • **Charles C. Gordon,** B.A. (Amherst), Ph.D. (North Carolina) • **Jared Tao Keil,** B.A. (Antioch), M.A., Ph.D. (Harvard) • **Katharine D. Kelly,** B.A., M.A., Ph.D. (Toronto) • **Karen March,** B.A., M.A., Ph.D. (McMaster) • **C. McKie,** B.A., M.A. (York), Ph.D. (Toronto) • **Rob Shields,** B.Arch., M.A. (Carleton), Ph.D. (Sussex) • **Derek G. Smith,** B.A. (British Columbia), M.A., Ph.D. (Harvard) •

Assistant Professors

Barclay D. Johnson, A.B. (Harvard), M.A., Ph.D. (California at Berkeley) • **Zhiqiu Lin,** B.A. (Heilongjiang), M.A. Ph.D. (Calgary) • **Heather Jon Maroney,** B.A. (Carleton), M.A., Ph.D. (McMaster) • **Caryll Steffens,** B.A., M.A. (Maryland), Ph.D. (North Carolina) • **Rosemary Warskett,** B.A. (Queen's), M.A., Ph.D. (Carleton)

Distinguished Research Professor

Gertrud Neuwirth

Adjunct Research Professors

Simon Brascoupe, Consultant • **Abdalla Bujra,** Consultant • **Jean-Philippe Chartrand,** Consultant • **Scott Clark,** Department of Justice Canada • **Bryan C. Gordon,** Archaeological Survey of Canada, Canadian Museum of Civilization • **Tony Haddad,** Consultant • **George F. MacDonald,** Canadian Museum of Civilization • **Marybelle Mitchell,** Consultant • **Douglas A. Norris,** Statistics Canada • **Franklin C. Pinch,** Consultant • **Bali Ram,** Statistics Canada • **Paul Reed,** Statistics Canada • **G.D. Reimer,** Consultant • **Stephen Richer,** Consultant • **T. John Samuel,** Consultant • **Vivian Shalla,** Consultant • **Allan Steeves,** Consultant • **George M. Torrance,** Consultant

Adjunct Professors

Hyman Burshtyn • **John Harp** • **Joseph Manyoni** • **Dennis Olsen**

General Information

The Department of Sociology and Anthropology offers the following undergraduate programs:

- B.A. (Honours) in Anthropology
- B.A. (Honours) in Sociology
- B.A. in Sociology-Anthropology

All of these programs can be taken either as principal areas of study or in combination with other disciplines. Details of these programs are outlined below.

The several types of courses offered by the Department are indicated by the following numerical prefixes:

- 53 Sociology
- 54 Anthropology
- 56 Sociology-Anthropology

Provided they meet the requirements of the particular program for which they are registered, students may select their courses from any or all of these.

Students may take both Sociology 53.100 and Anthropology 54.100 for credit, but only one will be included in the calculation of the Sociology/Anthropology GPA; the other will count toward the maximum credits permitted in Sociology/Anthropology. If Sociology/Anthropology 56.100 is taken, Sociology 53.100 or Anthropology 54.100 may not be taken for credit.

Mention: français

Students who wish to qualify for the "Mention: français" notation in Sociology/Anthropology may do so by taking the following pattern of courses in their degree program:

1. 1.0 credit in the advanced study of the French language (French 20.160).
2. 1.0 credit in French-Canadian culture and heritage (French 20.270).
3. 1.0 credit at the 200- or 300-level in Sociology and/or Anthropology taught in French at Carleton or at another University, and approved by the B.A. or B.A. (Honours) Program Co-ordinators.
4. In addition, for B.A. (Honours) Sociology or Anthropology, 1.0 credit at the 400-level in Sociology or Anthropology taught in French at Carleton or at another University, as approved by the respective B.A. (Honours) Program Co-ordinator.

Academic Audit Report

Each student is provided with an Academic Audit Report. This important document is a computerized statement of the student's degree and disciplinary requirements, matched with the courses completed or in progress; it also includes requirements left to be completed. Students who require assistance with the interpretation of their Academic Audit Report should refer to the Undergraduate Handbook, published by the Department of Sociology and Anthropology, and/or consult with the appropriate departmental program Co-ordinator.

Graduation Regulations

In order to graduate, students must fulfill all University graduation regulations (see p. 48), all Faculty regulations including those relating to First-Year Seminars and Breadth requirements (see p. 63), and all Major regulations and requirements as set out below.

Note: Anthropology 54.203 is a prerequisite for Anthropology 54.310 (Theory and Methodology in Anthropology). Students should take note of this in planning their program. Please consult with the Department on this issue.

B.A. (Honours) Programs

General

B.A. (Honours) programs may be entered from the B.A. (Honours) First year in the Arts and Social Sciences or by transfer from the B.A. program if the appropriate standing has been attained. Students taking B.A. (Honours) in Sociology or Anthropology are expected to meet the general University regulations governing the degree and to fulfill certain additional requirements depending on the program selected.

Sociology

The requirements are:

1. 9.0 credits in Sociology and/or Anthropology:
 - (a) one of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 with a grade of C+ or better;
 - (b) either Sociology 53.203 or Anthropology 54.203 (Sociology 53.203 is recommended);
 - (c) Sociology-Anthropology 56.205 and Sociology 53.406 (students should note that Sociology-Anthropology 56.205 (or 56.305) is a prerequisite for Sociology 53.406);
 - (d) Sociology 53.370 (it is recommended that students take Sociology 53.370 in the Third year);
 - (e) 2.0 credits in Sociology and/or Anthropology at the 400- or 500-level;
 - (f) 2.0 additional credits beyond the 100-level within the Department.
2. 3.0 credits in another discipline chosen in consultation with the Co-ordinator of the B.A. (Honours) program in Sociology.
3. A maximum of 12.0 credits in Sociology and/or Anthropology may be counted toward the degree of B.A. (Honours) in Sociology.
4. Students entering Fourth year must have and maintain a GPA of 6.5 or better in their Major; prior to that, a GPA of 6.0 or better in the Major discipline is required.
5. A total of 20.0 credits beyond Qualifying-University year is required.

It is recommended that students take a course (or courses) involving formal reasoning (e.g., Mathematics 69.109 ★ or 69.119 ★, or Philosophy 32.201 ★) during their first two years.

Students are strongly advised to consult the Co-ordinator of Honours (Sociology) regularly throughout their degree studies to ensure that they are observing departmental and University requirements.

Note: Beginning with the 1997-98 academic year, Sociology 53.495 (Honours Practicum) is no longer offered as part of the B.A. (Honours) Program, and is also no longer offered as an option.

Anthropology

The requirements are:

1. 9.0 credits in Anthropology and/or Sociology:
 - (a) one of Anthropology 54.100, Sociology 53.100, Sociology-Anthropology 56.100 with a grade of C+ or better;
 - (b) Anthropology 54.203;
 - (c) Anthropology 54.231 ★ and 54.409 ★;
 - (d) Anthropology 54.310;
 - (e) Anthropology 54.495;
 - (f) 1.5 credits Sociology and/or Anthropology at the 400- or 500-level;
 - (g) 2.5 additional credits beyond the 100-level within the Department.

2. A maximum of 12.0 credits in Anthropology and/or Sociology may be counted toward the degree of B.A. (Honours) in Anthropology.

3. Students entering Fourth year must have and maintain a GPA of 6.5 or better in their Major; prior to that, a GPA of 6.0 or better in the Major discipline is required.

4. A total of 20.0 credits beyond Qualifying-University year is required.

Students are strongly advised to consult the Co-ordinator of Honours (Anthropology) regularly throughout their degree studies to ensure that they are observing departmental and University requirements.

Concentrations

The Department of Sociology and Anthropology offers the following concentrations: B.A.(Honours) in Sociology with a Concentration in Power and Everyday Life; B.A. (Honours) in Anthropology with a Concentration in Power and Everyday Life; B.A.(Honours) in Sociology with a Concentration in Applied Social Research; B.A. (Honours) in Sociology with a Concentration in Population Studies.

Concentration in Power and Everyday Life

The Concentration in Power and Everyday Life provides an opportunity for study of social governance and regulation through the construction of the rhythms, routines and flows of everyday life. The courses enable students to see the sociological and anthropological complexity inherent in the simplest facets of society.

Admission to the Concentration

To be considered for admission to the concentration, students must satisfy the requirements for admission to, or continuation in, the Major in Sociology or Anthropology, and all Faculty regulations pertaining to Honours programs.

Admissibility to the concentration is determined by calculating the simple average of the GPA achieved in Sociology or Anthropology or Sociology-Anthropology courses at the time of application.

To continue in the concentration, a GPA of 6.5 or better is required in the PEL core courses.

Graduation Requirements

To graduate in the concentration, candidates must achieve a GPA of 6.5 or better in the PEL core courses in addition to the GPA in Sociology or Anthropology and the CI required for graduation with Honours. The graduation average in Sociology, or in Anthropology, shall be calculated over all successfully completed, graded courses used to meet the minimum requirements of the degree program and counting towards the degree.

Program Requirements

B.A. (Honours) in Sociology with a Concentration in Power and Everyday Life

The concentration consists of a minimum of 10.0 credits in Sociology or Anthropology allowed in PEL concentration.

- One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 with a grade of C+ or better;

- either Sociology 53.203 or Anthropology 54.203 (Sociology 53.203 is recommended)

- 56.202, 56.205 and Sociology 53.406 (Students should note that Sociology-Anthropology 56.205 (or 56.305) is a prerequisite for Sociology 53.406);

- Sociology 53.370 (it is recommended that students take Sociology 53.370 in Third year).

- Sociology-Anthropology 56.498★ and either 56.494★ or 56.496★. Students intending to complete the requirements for the Concentration in Power and Everyday Life will normally be expected to define a research topic (56.494★) or a research placement (56.496★) in consultation with faculty members at the end of the Third year.

- Minimum 3 elective credits in PEL:

- 1.5 credits from the list 56.303★, 56.308★, 56.316★, 56.325★, 56.326★, 56.330★, 56.339★, 56.360★, 56.361★, 56.383★.

- 1.5 credits from the list 56.408★, 56.409★, 56.412★, 56.420★, 53.440★, 56.444★, 56.450★, 56.456★, 56.461★, 56.465★, 56.477★, 56.479★.

B.A. (Honours) in Anthropology with a Concentration in Power and Everyday Life.

The concentration consists of a minimum of 9.0 credits in Sociology or Anthropology allowed in PEL concentration.

- One of Anthropology 54.100, Sociology 53.100, Sociology-Anthropology 56.100 with a grade of C+ or better;

- Anthropology 54.203, Sociology-Anthropology 56.202, Anthropology 54.231★

- Anthropology 54.310 and 54.409★;

- Sociology-Anthropology 56.497★ and either 56.494★ or 56.496★. Students intending to complete the requirements for the Concentration in Power and Everyday Life will normally be expected to define a research topic (56.494★) or a research placement (56.496★) in consultation with faculty members at the end of the Third year.

- Minimum 3 elective credits in PEL:

- 1.5 credits from the list 56.303★, 56.307★, 56.308★, 56.316★, 56.325★, 56.326★, 56.330★, 56.339★, 56.354★, 56.360★, 56.361★, 56.383★.

- 1.5 credits from the list 56.408★, 56.409★, 56.412★, 56.420★, 53.440★, 56.444★, 56.450★, 56.456★, 56.461★, 56.465★, 56.477★, 56.479★.

Concentration in Applied Social Research

The ASR concentration provides the opportunity for focused study relating to a variety of applications within the broad spectrum of social science research. It is designed to afford students with diverse methodological skills coupled with a strong theoretical and substantive background in Sociology. Students are then given hands-on experience in integrating these tools into applied analyses of various sociological issues.

Admission to the Concentration

To be considered for admission to the concentration, students must satisfy the requirements for admission to, or continuation in, the Major in Sociology, and all Faculty regulations pertaining to Honours programs.

Admissibility to the concentration is determined by calculating the simple average of the GPA achieved in Sociology or Anthropology or Sociology-Anthropology courses at the time of application. To continue in the concentration, a GPA of 6.5 or better is required in the ASR core courses.

Graduation Requirements

To graduate in the concentration, candidates must achieve a GPA of 6.5 or better in the ASR core courses in addition to the GPA in Sociology or Anthropology and the CI required for graduation with Honours. The graduation average in Sociology, or in Anthro-

pology, shall be calculated over all successfully completed, graded courses used to meet the minimum requirements of the degree program and counting towards the degree.

Program Requirements

B.A. (Honours) in Sociology with a Concentration in Applied Social Research.

The concentration consists of a maximum 11.0 credits in Sociology or Anthropology allowed in ASR concentration.

- Sociology 53.100 with a grade of C+ or better
- Sociology 53.203
- Sociology-Anthropology 56.205 and Sociology 53.406
- Sociology 53.370
- 1.0 credit from 53.251 ★, 53.351 ★, 53.382 ★, 53.383 ★
- 2.0 credits from 53.403 ★, 53.404 ★, 53.443 ★, 53.450 ★, 53.451 ★
- 53.401 ★ and 0.5 credit in Sociology or Anthropology beyond the 100-level, OR a field placement (53.400 ★) or research essay (53.493)
- 1.0 credit from 45.205 ★, 45.206 ★, 45.301 ★, 45.303 ★, 69.257 ★, 69.259 ★, 69.266 ★, 69.267 ★

Concentration in Population Studies

The concentration in Population Studies provides an opportunity for focused study on the growth and characteristics of human populations. This concentration includes formal demography, social demography, and applied population studies. The courses enable the student to be exposed to a variety of topics and approaches one needs to master the field of demographic analysis. Students take these courses in the area of population studies while completing an Honours program in the discipline of Sociology.

Admission to the Concentration

Students are admitted to the program at the end of their Third year of study, on the basis of their performance in courses taken up to that time, and on the recommendation of the Program Co-ordinator.

Carleton students applying for the concentration must do so through application to the Registrarial Services office no later than March 31, to be considered for a space in the concentration during their final year of study. Students from other institutions should consult the admissions section of this Calendar for deadlines and procedures.

Graduation Regulations

In order to graduate, students must fulfill all University graduation Regulations (see p. 48) and all Faculty regulations including those relating to First-Year Seminars and Breadth requirements (see p. 63), in addition to all departmental regulations and requirements as set out below.

Program Requirements

B.A. (Honours) in Sociology with a Concentration in Population Studies

The requirements of a B.A. (Honours) degree in Sociology with a Concentration in Population Studies are:

1. Sociology 53.100, Anthropology 54.100, or Sociology-Anthropology 56.100 with a grade of C+ or better. Sociology 53.100 is strongly recommended.
2. Sociology 53.203.
3. Sociology 53.370; or alternatively Mathematics 69.257 ★ and Math-

ematics 69.357 ★.

4. Sociology-Anthropology 56.205.

5. Sociology 53.406.

6. Sociology 53.400 ★ and a 0.5 additional credit in Sociology and/or Anthropology at the 400- or 500-level.

7. Sociology 53.493. The subject of the research project undertaken must be in the area of Population Studies.

8. Sociology 53.251 ★.

9. Sociology-Anthropology 56.220.

10. 1.5 additional credits in Sociology and/or Anthropology at the 200- or 300-level. The following courses are recommended: Sociology-Anthropology 56.234 ★, 56.241, Sociology 53.247, 53.252 ★, Anthropology 54.319 ★, Sociology-Anthropology 56.320 and 56.330 ★.

11. Sociology 53.351 ★.

12. 3.0 credits in another discipline chosen in consultation with the Co-ordinator of the B.A. (Honours) program in Sociology and the Co-ordinator for Population Studies.

Students must maintain a GPA of 6.5 or better in requirements 1 through 11 listed above, in order to remain in, and graduate with, the Concentration in Population Studies. A maximum of 12.0 credits in Sociology and/or Anthropology may be counted toward the degree of B.A. Honours in Sociology with Concentration in Population Studies.

Field Placement

Students are required to complete Sociology 53.400 ★ with an assignment at Statistics Canada or other agency as part of their concentration requirements. Students should contact the Placement Supervisor to complete arrangements for their placements during the first week of classes in September upon entrance to Fourth year.

Students are strongly advised to consult the Sociology Honours Co-ordinator and the Co-ordinator for Population Studies regularly through their degree studies to ensure that they are observing departmental, concentration, and University requirements.

Combined B.A. (Honours) in Sociology

Students are strongly advised to consult the Co-ordinator of Honours (Sociology) regularly throughout their degree studies to ensure that they are observing departmental and University requirements.

The general requirements for Combined B.A. (Honours) in Sociology are:

1. One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 with a grade of C+ or better.

2. Sociology 53.203 or Anthropology 54.203 (Sociology 53.203 is recommended).

3. Sociology-Anthropology 56.205 or Sociology 53.406; (students should note that Sociology-Anthropology 56.205 (or 56.305) is a prerequisite for Sociology 53.406).

4. Sociology 53.370 (it is recommended that students take Sociology 53.370 in the Third year).

5. 2.0 credits in Sociology and/or Anthropology at the 400-or 500-level.

6. 1.0 additional credit in Sociology and/or Anthropology beyond the 100-level.

A maximum of 9.0 credits in Sociology and/or Anthropology may be counted toward the degree of Combined B.A. (Honours) in Sociology and another discipline.

Students entering Fourth year must have and maintain a GPA of 6.5 or better in each Major; prior to that, a GPA of 6.0 or better in each Major discipline is required.

It is recommended that students take a course (or courses) involving formal reasoning (e.g., Mathematics 69.109 ★ or 69.119 ★, or Philosophy 32.201 ★) during their first two years.

The following programs are exceptions to the foregoing requirements:

Combined B.A. (Honours) in Sociology and Economics

The requirements in the Sociology component of this program are:

1. One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 with a grade of C+ or better.
2. Sociology 53.203 or Anthropology 54.203 (Sociology 53.203 is recommended), followed by Sociology 53.370 or Economics 43.220 (it is recommended that students who take Sociology 53.370 should do so in the Third year).
3. Sociology-Anthropology 56.205 or Sociology 53.406; (students should note that Sociology-Anthropology 56.205 (or 56.305) is a prerequisite for Sociology 53.406).
4. 2.0 credits in Sociology and/or Anthropology at the 400-or 500-level.
5. 1.0 additional credit in Sociology and/or Anthropology beyond the 100-level.

A maximum of 9.0 credits in Sociology and/or Anthropology may be counted toward the degree of Combined B.A. (Honours) in Economics and Sociology.

Students entering Fourth year must have and maintain a GPA of 6.5 or better in each Major; prior to that, a GPA of 6.0 or better in each Major discipline is required.

Note: Consult the Department of Economics.

Combined B.A. (Honours) in Sociology and Geography

The requirements in the Sociology component of this program are:

1. One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 with a grade of C+ or better.
2. Sociology 53.203 or Anthropology 54.203 (Sociology 53.203 is recommended).
3. Sociology-Anthropology 56.205 or Sociology 53.406; (students should note that Sociology-Anthropology 56.205 (or 56.305) is a prerequisite for Sociology 53.406).
4. Sociology 53.370 (if Geography 45.498 or 45.499 are taken, 1.0 optional Sociology and/or Anthropology credit beyond the 100-level can be substituted for Sociology 53.370; students who take Sociology 53.370 should do so in the Third year).
5. 2.0 credits in Sociology and/or Anthropology at the 400- or 500-level.
6. 1.0 additional credit in Sociology and/or Anthropology beyond the 100-level;

A maximum of 9.0 credits in Sociology and/or Anthropology may be counted toward the degree of Combined B.A. (Honours) in Geography and Sociology.

Students entering Fourth year must have and maintain a GPA of 6.5 or better in each Major; prior to that, a GPA of 6.0 or better in each Major discipline is required.

Note: Consult the Department of Geography and Environmental Studies.

Combined B.A. (Honours) in Sociology and Journalism

Students who combine Honours programs in Sociology and Journalism and who meet graduation requirements will graduate with the degree of Bachelor of Journalism unless they apply for the Bachelor of Arts. The requirements in the Sociology component of the programs are:

1. One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 with a grade of C+ or better.
2. Sociology 53.203 or Anthropology 54.203 (Sociology 53.203 is recommended).

Note: Mass Communication 27.201 can be substituted for Sociology 53.203 or Anthropology 54.203.

3. Sociology-Anthropology 56.205 or Sociology 53.406; (students should note that Sociology-Anthropology 56.205 (or 56.305) is a prerequisite for Sociology 53.406).

4. Sociology 53.370 (it is recommended that students take Sociology 53.370 in the Third year).

5. 2.0 credits in Sociology and/or Anthropology at the 400-or 500-level.

6. 1.0 additional credit in Sociology and/or Anthropology beyond the 100-level (not including Sociology-Anthropology 56.211, if taken before 1994-95).

A maximum of 9.0 credits in Sociology and/or Anthropology may be counted toward the degrees of Combined B.A. (Honours) in Journalism and Sociology or B.J. (with Sociology).

Students entering Fourth year must have and maintain a GPA of 6.5 or better in each Major; prior to that, a GPA of 6.0 or better in each Major discipline is required.

Note: Students are advised to consult the entry on Combined Honours in the Journalism section of this Calendar.

Combined B.A. (Honours) in Sociology and Mass Communication

The requirements in the Sociology component of this program are:

1. One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 with a grade of C+ or better.
2. Sociology 53.203 or Anthropology 54.203 (Sociology 53.203 is recommended).

Note: Mass Communication 27.201 can be substituted for Sociology 53.203 or Anthropology 54.203.

3. Sociology-Anthropology 56.205 or Sociology 53.406; (students should note that Sociology-Anthropology 56.205 (or 56.305) is a prerequisite for Sociology 53.406).

4. Sociology 53.370 (it is recommended that students take Sociology 53.370 in the Third year).

5. 2.0 credits in Sociology and/or Anthropology at the 400-or 500-level.

6. 1.0 additional credit in Sociology and/or Anthropology beyond the 100-level (not including Sociology-Anthropology 56.211 or 56.311 (if taken before 1994-95), 56.430 ★, 56.431 and 56.432 ★).

A maximum of 9.0 credits in Sociology and/or Anthropology may be counted toward the degree of Combined B.A. (Honours) in Mass Communication and Sociology.

Students entering Fourth year must have and maintain a GPA of 6.5 or better in each Major; prior to that, a GPA of 6.0 or better in each Major discipline is required.

Note: Consult Mass Communication.

Combined B.A. (Honours) in Sociology and Political Science

The requirements in the Sociology component of this program are:

1. One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 with a grade of C+ or better.
2. One of the following methods sequences:
 - (a) in the Second year, Political Science 47.270; in the Third year, Sociology 53.370; or
 - (b) in the Second year, Sociology 53.203 or Anthropology 54.203 (Sociology 53.203 is recommended); in the Third year, Political Science 47.471 ★ and 47.472 ★ (students should note that Political Science 47.471 ★ and 47.472 ★ may not be offered every year).
3. Sociology-Anthropology 56.205 or Sociology 53.406 (students should note that Sociology-Anthropology 56.205 (or 56.305) is a prerequisite for Sociology 53.406).
4. 2.0 credits in Sociology and/or Anthropology at the 400-or 500-level.
5. 1.0 additional credit in Sociology and/or Anthropology beyond the 100-level.

A maximum of 9.0 credits in Sociology and/or Anthropology may be counted toward the degree of Combined B.A. (Honours) in Political Science and Sociology.

Students entering Fourth year must have and maintain a GPA of 6.5 or better in each Major; prior to that, a GPA of 6.0 or better in each Major discipline is required.

Note: Consult the Department of Political Science.

Combined B.A. (Honours) in Sociology and Psychology

The requirements in the Sociology component of this program are:

1. One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 with a grade of C+ or better.
2. Sociology 53.203 or Anthropology 54.203 (Sociology 53.203 is recommended). Note: Students who take Psychology 49.200 may substitute 1.0 optional Sociology and/or Anthropology credit beyond the 100-level for Sociology 53.203 or Anthropology 54.203.
3. Sociology-Anthropology 56.205 or Sociology 53.406; (students should note that Sociology-Anthropology 56.205 (or 56.305) is a prerequisite for Sociology 53.406).
4. 2.0 credits in Sociology and/or Anthropology at the 400-or 500-level.
5. Sociology 53.370 and 1.0 additional credit in Sociology and/or Anthropology beyond the 100-level. If the Honours Thesis or Essay is written in Psychology, 2.0 additional credits in Sociology and/or Anthropology beyond the 100-level.

A maximum of 9.0 credits in Sociology and/or Anthropology may be counted toward the degree of Combined B.A. (Honours) in Psychology and Sociology.

Students entering Fourth year must have and maintain a GPA of 6.5 or better in each Major; prior to that, a GPA of 6.0 or better in each Major discipline is required.

Note: Consult the Department of Psychology.

Combined B.A. (Honours) in Anthropology

Students intending to enter a Combined B.A. (Honours) program combining Anthropology with another discipline should take one of Anthropology 54.100, Sociology 53.100, Sociology-Anthropology 56.100 and the introductory course in the other discipline in their First year. A minimum of 6.0 credits in Anthropology and/

or Sociology is required, but not more than 9.0 credits in Anthropology and/or Sociology may be counted toward the degree of Combined B.A. (Honours) in Anthropology and another discipline.

Students are strongly advised to consult the Co-ordinator of Honours (Anthropology) regularly throughout their degree studies to ensure that they are observing departmental and University requirements.

The general requirements for Combined B.A. (Honours) in Anthropology are:

1. One of Anthropology 54.100, Sociology 53.100, Sociology-Anthropology 56.100 with a grade of C+ or better.
2. Anthropology 54.203.
3. Anthropology 54.310.
4. 1.0 credit in Anthropology and/or Sociology at the 400-or 500-level.
5. (a) If the Honours Practicum is taken in Anthropology, Anthropology 54.231 ★, 54.409 ★, and 54.495;
(b) If the Honours Essay is written in the other discipline, 2.0 additional credits in Anthropology and/or Sociology beyond the 100-level.

Normally, Honours students will be expected to undertake an Honours Essay in one of the disciplines. In those cases where the second discipline does not require an Honours Essay, alternative arrangements may be considered by the Co-ordinator of Honours (Anthropology).

Students entering Fourth year must have and maintain a GPA of 6.5 or better in each Major; prior to that, a GPA of 6.0 or better in each Major discipline is required.

B.A. Program

B.A. Program In Sociology-Anthropology

1. Students in the B.A. program in Sociology-Anthropology must successfully complete 6.0 credits in the sociology-anthropology field:

- (a) one of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 with a grade of C- or better;
- (b) either Sociology 53.203 or Anthropology 54.203;
- (c) either Sociology-Anthropology 56.205 or Anthropology 54.310;
- (d) 1.0 further credit in Sociology and/or Anthropology above the 200-level;
- (e) 2.0 additional credits beyond the 100-level in Sociology and/or Anthropology.

2. Students may not count more than 9.0 credits in Sociology and/or Anthropology toward a B.A. degree.

3. Final year students with the required standing may be given permission to take a course at the 400-level. It is also expected that some work will be taken in related disciplines in the Social Sciences.

4. Students must have a GPA of 4.0 or better in Sociology and/or Anthropology courses counting toward the degree requirements (see 1. above) in order to graduate.

5. A total of 15.0 credits beyond Qualifying-University year is required.

Students are strongly advised to consult the Co-ordinator of the B.A. program regularly throughout their degree studies to ensure that they are observing departmental and University requirements.

Criminology and Criminal Justice

For details see p. 205.

Minor in Sociology

Students in other disciplines may apply to complete a Minor in Sociology consisting of 4.0 credits.

Requirements are:

53.100;
53.203 or 56.205;
2.0 additional Sociology credits at the 200-level or above.

Note: At least 2.0 credits must be taken at Carleton.

Minor in Anthropology

Students in the discipline may apply to complete a Minor in Anthropology consisting of 4.0 credits.

Requirements are:

54.100;
54.203;
2.0 additional credits in Anthropology at the 200-level or above.

Note: At least 2.0 credits must be taken at Carleton.

Graduate Programs

The Department offers studies leading to the following graduate degrees: M.A. in Sociology, M.A. in Social Anthropology and Ph.D. in Sociology. For further details consult the Calendar of the Faculty of Graduate Studies and Research. Fourth-year Honours students may take one or more graduate seminars with the permission of the Department.

Prerequisite

The normal prerequisite for courses taken beyond the 100-level is one of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100. Otherwise, students may be admitted with permission of the Department.

Course-Related Tutorials

Students within the Department may include among their courses one or more tutorials. Further information is available from the Undergraduate Program Co-ordinators.

Written permission from the Chair of the Department of Sociology and Anthropology is necessary before registration in these courses can take place.

Graduate Courses

Fourth-year Honours students are encouraged to take one or more graduate seminars, which are available to them with the permission of the Department. A variety of theoretical, substantive and methodological courses are available. Specific details are contained in the *1999-2000 Faculty of Graduate Studies and Research Calendar*.

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

First-Year Seminar in Sociology and Anthropology 01.141

Multiculturalism in Canada

Issues relating to the development of and interaction among cultural communities with major emphasis on the realities of "doing multiculturalism in Canada". Research teams; organized seminars with volunteers from Canadian cultural and community groups. Limited enrolment.

Requirement for Breadth, for students in B.A. or B.A.(Honours) degrees

Category for Breadth	Courses in this unit
The temporal dimension of human societies, analyzing times before the present era or societies other than our own	Anthropology (54.) 225, 318★, 335★
The artifacts of the imagination in literature and/or other forms, or that addresses the life of the imagination and culture.	Anthropology (54.) 334★; Sociology/Anthropology (56.)383★, 384★
The understanding of social, technological and/or natural processes and the ways in which that understanding is obtained in science and social science.	Anthropology (54.)100, 207★, 248★, 249★, 275★, 01.141; all Sociology/Anthropology courses not listed in any other category; all courses in Sociology
Matters of human values, ethics and social responsibilities	(56.)101

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

Sociology 53.100

Introduction to Sociology

Introduction to the comparative study of social groups, classes and institutions. The main emphasis is on industrialized societies with special attention given to Canadian society.

Precludes additional credit for Sociology-Anthropology 56.100.

Students in any Sociology and/or Anthropology program should consult the departmental General Information section on p. 438 and the departmental Honours/Combined Honours, B.A. sections on p. 438.

Lectures three hours a week.

Anthropology 54.100

Introduction to Anthropology

Introduction to the nature and evolution of human cultural systems and forms of adaptation from hunting and gathering to farming and stratified state formations. Attention is given to institutions such as the family, economics, politics and religion.

Precludes additional credit for Sociology-Anthropology 56.100.

Students in any Sociology and/or Anthropology program should consult the departmental General Information section on p. 438 and the departmental Honours/Combined Honours, B.A. sections on p. 438.

Lectures three hours a week.

Sociology-Anthropology 56.100

Principles of Comparative Social Structure: Sociology and Anthropology

Introduction to the comparative study of human society from the parallel perspective of sociology and social anthropology. The principal focus is on continuity and change in the development of relatively simple and highly complex societies.

Precludes additional credit for Sociology 53.100 or for Anthropology 54.100.

Students in any Sociology and/or Anthropology program should consult the departmental General Information section on p. 438 and the departmental Honours/Combined Honours, B.A. sections on p. 438.

Lectures three hours a week.

Sociology-Anthropology 56.101

Human Rights

Introductory survey of human rights issues such as: foundations and nature of rights; roots of inequality and oppression; aboriginal rights; racism; women and rights; sexual orientation; state and corporate power; economic exploitation; the environment and rights; warfare; torture; and social movements. (Also listed as Social Sciences 03.101)

Precludes additional credit for First-Year Seminar in Human Rights 01.114.

Lecture and discussion groups three hours a week.

Sociology-Anthropology 56.202

Power and Everyday Life

A thematic investigation of the intersection of relations of power and experience in everyday life. Topics may include: leisure, consumption, identity, fashion, sexuality, tourism, health, skills, pollution, and work.

Prerequisites: Sociology 53.100 or Anthropology 53.100 or Sociology-Anthropology 56.100 or permission of the Department. Lecture and discussion three hours a week.

Sociology 53.203

Introduction to Sociological Research

Introduction to general issues in sociological research. Topics include the logic of research, problems of research design, fundamental techniques of data collection in sociology and problems in the ethics of research. Students are introduced to both qualitative and quantitative research methods.

Precludes additional credit for Anthropology 54.203.

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, or permission of the Department.

Lectures and workshop three hours a week.

Anthropology 54.203

Introduction to Anthropological Research

Introduction to general theoretical and methodological issues in anthropological research. Topics include the relation between theory and observation, problems of research design, fundamental techniques of data collection, the actual experience of fieldwork, and problems in the ethics of research.

Precludes additional credit for Sociology 53.203.

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, or permission of the Department.

Lectures and workshop three hours a week.

Sociology-Anthropology 56.205

The Development of Sociological and Anthropological Thought

Sociological and anthropological thought since the end of the eighteenth century. Various theoretical approaches within their historical, social and intellectual contexts. Connections between theoretical traditions and current theoretical debates in sociology and anthropology.

Precludes additional credit for Sociology/Anthropology 56.305.

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, or permission of the Department.

Lectures three hours a week.

Anthropology 54.206 ★

Cultural Adaptations and the Environment

Ways in which humans affect and are affected by the natural environment. Focus on simpler, non-industrial societies whose modes of subsistence are based upon hunting and gathering, horticulture, or pastoralism.

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, or permission of the Department.

Lectures three hours a week.

Anthropology 54.207 ★

The Anthropology of Conquest

What happens to non-Western societies in contact with colonial or industrial nation-states. Specific topics include forced labour, acculturation and ethnocentrism, wars of extermination, treaty-making and land policies, revitalization movements and other aboriginal responses to conquest.

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, or permission of the Department.

Lectures three hours a week.

Sociology 53.210

Social Psychology

Relationship between the individual and the social system. Emphasis on integrating individual and social approaches. Topics include attitudes, cognition, motivations, group processes such as socialization, symbolic interaction, coercion, conformity, leadership, cohesion.

Precludes additional credit for Psychology 49.210 ★.

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, introductory Psychology, or permission of the Department.

Lectures three hours a week.

Sociology-Anthropology 56.211

The Sociology of Media Studies

Topics in the area of media studies and their relationship to cultures and social structures will be treated.

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, or permission of the Department.

Lectures three hours a week.

Sociology-Anthropology 56.215 ★

Language, Ideology and Power

This course will examine the ways in which different social conditions determine a variety of properties of language in use. Attention will be paid in particular to the linguistic resources for expressing ideological beliefs and for maintaining and reinforcing existing power structures in different institutional and social sites. (Also listed as Linguistics and Applied Language Studies 29.275 ★.)

Lectures three hours a week.

Sociology-Anthropology 56.216 ★

Conversational Analysis

Methods and theory for analysing ordinary talk. Differences between language in conversation and formal spoken and written language. The relation of conversational analysis to other approaches to studying language. The connection between conversational analysis and studies of interaction. (Also listed as Linguistics and Applied Language Studies 29.276 ★.)

Lectures three hours a week

Sociology-Anthropology 56.220

Canadian Society

The course focuses on the study of Canadian society as an ongoing social system. Alternative theoretical perspectives are developed and examined for the interpretation they provide of recurrent social issues. Special attention is given to persistence and change in regional, ethnic, class and sex-role differences.

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, or permission of the Department.

Lectures three hours a week.

Anthropology 54.221 ★

Phonetics

Recognition, description, transcription and production of speech sounds; systems of transcription; the nature of the speech-pro-

ducing mechanism; the acoustics of speech sounds. (Also listed as Linguistics and Applied Language Studies 29.201 ★.)

Precludes additional credit for Anthropology 54.301 ★ and Linguistics and Applied Language Studies 29.301 ★.

Prerequisite: Linguistics 29.100

Lectures three hours a week..

Anthropology 54.223 ★

Language Analysis

Direction and practice in the analysis of grammatical material, including both morphology and syntax. Models for the description of grammatical regularities. Course work consists principally of practical exercises. (Also listed as Linguistics and Applied Language Studies 29.203 ★.)

Precludes additional credit for Anthropology 54.303 ★ and Linguistics 29.303 ★.

Prerequisite: Linguistics 29.100.

Lectures three hours a week.

Anthropology 54.225

Prehistoric Anthropology, Cultural and Biological Evolution of Humans

An examination, from an evolutionary point of view, of the physical anthropology and archaeology of early humans, their origins, the development of technology and of complex institutions, and the nature of racial differences.

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, or permission of the Department.

Lectures three hours a week.

Anthropology 54.231 ★

Writing About Culture

The development of anthropological theory and methods through the in-depth exploration of ethnographic texts. Explores the development of inter-cultural research through reading works which have shaped the discipline and contemporary issues through the study of recent publications.

Precludes additional credit for Anthropology 54.230.

Prerequisite: One of Sociology 53.100, Anthropology 54.100 or Sociology-Anthropology 56.100 or equivalent or permission of the Department.

Lecture and discussion three hours a week

Sociology-Anthropology 56.234 ★

Race, Racism and Ethnicity

An examination of the impact of racism on social relations utilizing historical critical perspectives. This course explores such phenomena as ethnicity, nationalism, colonialism, diasporic cultures and hybridity. It also addresses the influence of migration on race and ethnic relations in diverse societies.

Precludes additional credit for Sociology-Anthropology 56.235.

Prerequisite: One of 53.100, 54.100 or 56.100 or equivalent or permission of the Department.

Lecture and discussion three hours a week.

Sociology-Anthropology 56.241

Kinship, Marriage and the Family

Examination of contemporary marriage and family life with emphasis on Canadian society, historical and cross-cultural aspects of kinship and family forms, changes in marriage and parenthood and associate social policy.

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, or permission of the Department.

Lectures three hours a week.

Sociology-Anthropology 56.243

Religion and Society

Cross-cultural survey of religious institutions, with attention to theories and methodologies in the study of religion. Topics include myth, totemism, cults, ritual, altered states of consciousness,

and the relationship of religion to other social institutions and processes. (Also listed as Religion 34.243.)

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, or permission of the Department.

Lectures three hours a week.

Sociology 53.247

Women in Society

Enquiry into the historical and contemporary roots of sex-role determination. A comparative analysis of the position of women in various social formations is attempted, in conjunction with an examination of various theoretical perspectives concerning women's societal role. Emphasis is on the Canadian context.

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, or permission of the Department.

Lectures three hours a week.

Anthropology 54.248 ★

The Anthropology of Women

Examination of male and female roles and status in relation to societal factors such as economics, decision-making, and ideology. Emphasis is on the study of women in traditional, and changing, non-Western pre-industrial societies.

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, or permission of the Department.

Lectures three hours a week.

Anthropology 54.249 ★

Development, Dependency and Gender

Examination of anthropological and feminist analyses of the changing gendered division of labour in the Third and Fourth Worlds. Emphasis on case studies that illustrate the impact of "development" or "underdevelopment" on gender roles and gender inequality.

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, or permission of the Department.

Lectures three hours a week.

Sociology 53.251 ★

Introduction to Population Studies

Introduction to the basic principles of demography. Past and present population growth, and the determinants of population growth, are examined. Interrelations among demographic, social, cultural and economic factors are investigated. Where possible, Canadian demographic material is discussed.

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, or permission of the Department.

Lectures three hours a week.

Sociology 53.252 ★

Sociology of Aging and the Elderly

Implications of population aging for Canadian social structure. Major issues, theories and research regarding aging and the elderly in contemporary society. Canada's changing age structure and the economy, the polity, social policy, the family, the composition and living conditions of the elderly.

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, or permission of the Department.

Lectures three hours a week.

Sociology 53.254 ★

Urban Sociology

Issues related to people and the urban environment, including the historical process of urbanization, rural-urban transition, the diffusion of urban values and life styles, contemporary urban prob-

lems, such as urban renewal, pollution and the pressures of the urban environment on social institutions.

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, or permission of the Department.

Lectures three hours a week.

Sociology 53.255 ★

Sociology of Deviance

Analysis of the relation of deviant and criminal behaviour in modern society to the functioning of social systems. A special emphasis is given to theories of causation, types of deviance, the creation and evasion of rules and social roles of deviants.

Prerequisite: Grade of C- or better in one of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent.

Lectures three hours a week.

Sociology 53.256 ★

Police in Society

Examination of the organization and activities of the police in industrialized societies. Particular attention is devoted to Canadian information, and the themes of social control, police discretion, and the relations of police to a democratic society.

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, or permission of the Department.

Lectures three hours a week.

Sociology 53.257 ★

The Sociology of Work

Study of the sociological aspects of work with particular emphasis on: the changing meaning of work; changing impact of technology; alienation; shift from primary to secondary to tertiary sectors; changing participation rate of men and women; ethnicity and work; impact of social policy; and labour resources problems in developed and developing societies.

Precludes additional credit for Sociology 53.245.

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, or permission of the Department.

Lectures three hours a week.

Sociology 53.258 ★

The Sociology of Occupations and Professions

Study of the social history of occupations; and an examination of: occupational choice; recruitment; training and careers in non-professional and professional occupations; traditional and non-traditional views of professions, semi and para professions; and the changing participation and experiences of women in traditional and non-traditional occupations.

Precludes additional credit for Sociology 53.245.

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, or permission of the Department.

Lectures three hours a week.

Sociology 53.260 ★

Community

The community is studied as a localized social system in a larger social setting. This involves analysis of demographic and ecological factors as well as a variety of community-based institutions. Special attention is given to decision-making, community planning and development.

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, or permission of the Department.

Lectures three hours a week.

Sociology 53.271 ★

Criminology

The study of the relationship of crime and social structure with a special emphasis on policies and programs by which society reacts to crime.

Precludes additional credit for Sociology 53.270.

Prerequisite: Grade of C- or better in one of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent.

Lectures three hours a week.

Anthropology 54.275 ★

Technology, Mind and Culture

Anthropological perspective on technology, how it evolved and how it has influenced the human experience and adaptation. Role of technology in the evolution of consciousness and culture.

Precludes additional credit for Sociology-Anthropology 56.285 ★ (if taken in 1993 - Fall term 1994).

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, or permission of the Department.

Lectures three hours a week.

Anthropology 54.284 ★

Language and Culture

Study of language in anthropology. Topics include: evolution of the brain and language, communication among non-human primates, historical linguistics, hermeneutics, non-verbal communication, gender and language, language change and developmental linguistics.

Precludes additional credit for Anthropology 54.371 ★ (taken prior to 1983-84), and for Sociology-Anthropology 56.285 ★ and 56.326 ★ (taken with the same topic.)

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, or Linguistics and Applied Language Studies 29.100, or permission of the Department.

Lectures and workshop three hours a week.

Sociology-Anthropology 56.285 ★

Selected Topics

Selected topics in sociology and/or anthropology, not ordinarily treated in the regular course program. The choice of topics varies from year to year. Students should check with the Department regarding the topic offered.

Sociology-Anthropology 56.286 ★

Selected Topics

Selected topics in sociology and/or anthropology, not ordinarily treated in the regular course program. The choice of topics varies from year to year. Students should check with the Department regarding the topic offered.

Sociology-Anthropology 56.291 ★

Course-Related Tutorials

See explanatory note on p. 443.

Sociology-Anthropology 56.292 ★

Course-Related Tutorials

See explanatory note on p. 443.

Sociology 53.301 ★

Alcohol and Other Drugs: Contributions from the Social Context

Survey of alcohol and other drug use in cross-cultural and subgroup perspectives. Examines relationships between culture, social structure and patterns of use of psychoactive substances. Topics may include: alcohol use and the life cycle, drug policies (national and international) and treatment.

Prerequisite: Sociology 53.100 or Sociology-Anthropology 56.100, 53.255 ★, Third-year standing or permission of the Department.

Lecture and discussion three hours a week.

Anthropology 54.302★

Phonology

The sound-systems of languages; methods for the analysis and description of phonological structure. The course concentrates on generative theory with comparisons to other theories. (Also listed as Linguistics and Applied Language Studies 29.302★.)

Prerequisite: Linguistics and Applied Language Studies 29.201★ or Anthropology 54.221★.

Sociology-Anthropology 56.303★

Documentary Systems

The production and management of knowledge in the form of documentary systems by governments and private bodies and their consequences for everyday life. Topics may include: the market for information, data mining and privacy, documentary control as social power, the critical analysis of documentary practices.

Prerequisites: Third-year standing or permission of the Department.

Lecture and discussion, three hours per week.

Anthropology 54.304★

Grammatical Theory

Comparison of major current schools of linguistics. Theories of grammatical structure. The testing of grammatical hypotheses, grammatical structure and meaning. Course work consists principally of lectures and readings. (Also listed as Linguistics 29.304★.)

Prerequisite: Linguistics and Applied Language Studies 29.203★ or Anthropology 54.223★.

Sociology-Anthropology 56.307★

Aboriginal Peoples and Governmentality

Cultural practices of governance and regulation, relations of ruling, and the subordination of aboriginal peoples across types of social formation. Topics may include: registration schemes, definitions of status and affiliation, relations of tutelage, property issues, forms of resistance and non-compliance.

Prerequisite: Third-year standing or permission of the Department.

Lectures three hours a week

Sociology-Anthropology 56.308★

Sex

The relations among sex, sexuality and gender; sex and its regulation; and links between discourses of sex and morals. Topics may include: the question of sexual revolution, sexual pluralism, sex and social domination.

Prerequisites: Third-year standing or permission of the Department.

Lectures three hours a week

Anthropology 54.310

Theory and Methodology in Anthropology

Theory and methods in anthropology. Some attention to early developments in anthropological theory. Emphasis on the contemporary formulations of functionalism, exchange theory, cultural ecology, structuralism, Marxism, feminism, and critical theory.

Prerequisite: Eligibility for Third-year standing and one of Sociology 53.100, Anthropology 54.100, or Sociology-Anthropology 56.100; or permission of the Department

Lectures three hours a week.

Sociology-Anthropology 56.312★

Communication, Architecture and the Social Environment

Theoretical consideration and applied examination of how fixed and movable elements of architectural design and socio-cultural factors influence interaction. Space and territoriality will be central concerns. Additional topics may include: time, colour, temperature, and sound.

Precludes additional credit for Sociology-Anthropology 56.311.

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, 53.203 or 54.203, 56.211

and Third-year standing or permission of the Department.
Lecture and discussion three hours a week.

Sociology-Anthropology 56.313★

Distance Communication: Gesture and Vocalities

Theoretical consideration and applied examination of how the body and non-spoken aspects of language influence interaction. Inter-cultural similarities and variations are considered.

Precludes additional credit for Sociology-Anthropology 56.311.

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, 53.203 or 54.203, 56.211, 56.312★ and Third-year standing or permission of the Department.

Lecture and discussion three hours a week.

Sociology-Anthropology 56.314★

Intimate Interaction I: Odour and Appearance.

Theoretical consideration and applied examination of how odour and appearance influence inter-personal communication. Inter-cultural similarities and variations are considered.

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, 53.203 or 54.203, 56.211, 56.312★ and Third-year standing or permission of the Department.

Lecture and discussion three hours a week.

Sociology 53.315

Sociology of Education

Examination of educational institutions, their interplay with one another and with other social institutions; educational opportunity; the school and university as organizations; individual and social effects of education; the sociology of learning. Comparative consideration of contemporary critiques of the education system.

Prerequisite: Eligibility for Third-year standing and one of Sociology 53.100, Anthropology 54.100, or Sociology-Anthropology 56.100; or permission of the Department

Lectures three hours a week.

Sociology-Anthropology 56.316★

Children and Childhood

A socio-historical and cross-cultural examination of the construction and deconstruction of childhood in popular culture and global practices. Issues addressed include: child development theories, child labour, trafficking in and sexualization of children, protection and regulation in law, Kid culture and children's social movements.

Prerequisites: Third-year standing or permission of the Department.

Lectures three hours a week

Anthropology 54.317★

Visual Anthropology

Examination of the anthropological experience as reflected in film. A number of problems are considered, including selectivity, bias, the effect of the observer's presence, and problems in reconstructing past events in film.

Prerequisite: Eligibility for Third-year standing and one of Sociology 53.100, Anthropology 54.100, or Sociology-Anthropology 56.100; or permission of the Department.

Lectures three hours a week.

Anthropology 54.318★

Archaeology in Canada

Archaeological practice in North America, with particular emphasis on Canada. Topics include: human settlement of the Americas; archaeological perspectives on the cultural histories of Native American peoples; the construction of Native peoples' culture histories and European contact.

Prerequisite: Eligibility for Third-year standing and one of Sociology 53.100, Anthropology 54.100, or Sociology-Anthropology 56.100; or permission of the Department.

Lectures three hours a week.

Anthropology 54.319 ★

Issues in Canadian Native Studies

Anthropological examination of issues and policies concerning Canadian Indian, Inuit and Métis peoples. The course explores controversies surrounding social change, native rights, cultural autonomy and women's status.

Precludes additional credit for Anthropology 54.219 ★.

Prerequisite: Eligibility for Third-year standing and one of Sociology 53.100, Anthropology 54.100, or Sociology-Anthropology 56.100; or permission of the Department.

Lectures three hours a week.

Sociology-Anthropology 56.320

French Canada and Québec Society

Analysis of the economic, cultural and political aspects of present-day French Canada and Québec society, with special reference to the interplay of class, culture and nation. Reading knowledge of French is helpful, but not required.

Prerequisite: Eligibility for Third-year standing and one of Sociology 53.100, Anthropology 54.100, or Sociology-Anthropology 56.100; or permission of the Department.

Lectures three hours a week.

Sociology 53.321 ★

Gender and Criminal Justice

An overview of women as both perpetrators and victims of crime, and the criminal justice system's response to them. Topics may include: woman abuse, sexual assault, federally sentenced women.

Prerequisite: Sociology 53.100 and 53.271 ★, Third-year standing or permission of the Department.

Lecture and discussion three hours a week.

Sociology-Anthropology 56.325 ★

Selected Topics in Sociology-Anthropology

Selected topics in sociology and/or anthropology, not ordinarily treated in the regular course program. The choice of topics varies from year to year. Students should check with the Department regarding the topic offered.

Prerequisite: Eligibility for Third-year standing and one of Sociology 53.100, Anthropology 54.100, or Sociology-Anthropology 56.100; or permission of the Department.

Lecture and discussion three hours a week.

Sociology-Anthropology 56.326 ★

Selected Topics in Sociology-Anthropology

Selected topics in sociology and/or anthropology, not ordinarily treated in the regular course program. The choice of topics varies from year to year. Students should check with the Department regarding the topic offered.

Prerequisite: Eligibility for Third-year standing and one of Sociology 53.100, Anthropology 54.100, or Sociology-Anthropology 56.100; or permission of the Department.

Lecture and discussion three hours a week.

Sociology-Anthropology 56.330 ★

Selected Topics in Race and Ethnic Studies

Explores a specific focus in race and ethnic studies taught from a non-Eurocentric perspective.

Precludes additional credit for Sociology-Anthropology 56.235.

Prerequisite: One of Sociology 53.100, Anthropology 54.100 or Sociology-Anthropology 56.100 or equivalent or permission of the Department.

Lecture and discussion three hours a week.

Anthropology 54.334 ★

Culture and Symbols

Anthropological methods are employed to examine symbols in all parts of the world. Topics include religious rituals, mythology, folklore, art, primitive classification, kinship and politics.

Prerequisite: Eligibility for Third-year standing and one of Sociol-

ogy 53.100, Anthropology 54.100, or Sociology-Anthropology 56.100; or permission of the Department.

Lectures three hours a week.

Anthropology 54.335 ★

The Prehistory of Human Settlement

Examination of how human societies utilize space. Archaeological data are used to compare the settlement patterns of hunting and gathering peoples with those of more settled village and urban dwellers. Prerequisite: Eligibility for Third-year standing and one of Sociology 53.100, Anthropology 54.100, or Sociology-Anthropology 56.100; or permission of the Department.

Lectures three hours a week.

Anthropology 54.336 ★

Medical Anthropology

Cross-cultural study of approaches, institutions and techniques of healing; cultural and biological factors in the causation, diagnosis, treatment and meaning of disease. Cross-cultural epidemiology, ritual and symbolic healing, transcultural psychiatry, ethnopharmacology, midwifery.

Precludes additional credit for Sociology-Anthropology 56.325 ★ (if taken in Fall 1987).

Prerequisite: Eligibility for Third-year standing and one of Sociology 53.100, Anthropology 54.100, or Sociology-Anthropology 56.100; or permission of the Department.

Lectures three hours a week.

Sociology-Anthropology 56.339 ★

Society and Shelter

Buildings and shelter as human and social products. Topics may include: the perception and cognition of the built environment and its impact on social processes; the design, construction and use of buildings as social processes; the design professions; shelter and social stratification. (Also listed as Architecture 76.423 ★).

Precludes additional credit for Sociology 53.339 ★.

Prerequisite: Eligibility for Third year standing and one of Sociology 53.100, Anthropology 54.100, or Sociology-Anthropology 56.100, or permission of the Department

Lectures three hours a week.

Sociology 53.345 ★

Stratification and Mobility

Principal theoretical and empirical questions in social class and social mobility in complex societies. Bases and forms of inequality are examined with data from Canada, England, the United States, Eastern Europe, China, Japan and other societies.

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, or permission of the Department.

Lectures three hours a week.

Sociology 53.346 ★

Industrial Sociology

Inquiry into the development, structure and prospects of industrial society and post-industrial society; the relation of industrial institutions to the rest of society; the internal organization of industrial institutions; problems of management, labour and union relations.

Precludes additional credit for Sociology 53.246 ★.

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, or permission of the Department.

Lectures three hours a week.

Sociology 53.347 ★

Power

The principal concern of the course is the nature of power in human groups - its sources, forms and processes. Particular attention is paid to community and national elites and power structures.

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Soci-

ology-Anthropology 56.100 or equivalent, or permission of the Department.

Lectures three hours a week.

Sociology 53.348 ★

Collective Behaviour and Social Movements

Enquiry into the process of collective action as part of social change at various levels. Topics discussed include crowds, fashions, labour, political and religious movements, rebellion and revolution. Prerequisite: Eligibility for Third-year standing and one of Sociology 53.100, Anthropology 54.100, or Sociology-Anthropology 56.100; or permission of the Department.

Lectures three hours a week.

Sociology 53.350 ★

Political Behaviour

Examination of sociological contributions to the study of political behaviour and of the relations between politics and the social structure, both in Canada and in other societies. Emphasis is placed upon political socialization, the class basis of politics, conflict, mass movements and change.

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, or permission of the Department.

Lectures three hours a week.

Sociology 53.351 ★

Methods of Population Analysis

Introduction to demographic techniques. Problems in the collection and analysis of population data, such as population censuses and vital registration. Emphasis is placed upon the application of "demographic" methods (e.g., cohort analysis) to other areas of sociological investigation.

Prerequisite: Eligibility for Third-year standing and one of Sociology 53.100, Anthropology 54.100, or Sociology-Anthropology 56.100; or permission of the Department.

Lectures three hours a week.

Sociology 53.356 ★

Complex Organizations

Large-scale organizations in industrial and post-industrial societies; their origins; the varieties of forms they may take; various sociological explanations; the relation of organizations to the structure and culture of societies; class, gender and culture within complex organizations.

Precludes additional credit for Sociology 53.355.

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, or permission of the Department.

Lectures three hours a week.

Sociology 53.357 ★

Law Enforcement

A comparative study of contemporary law enforcement practices. Private and public policing are examined in Canada and other societies (in particular the United States and the United Kingdom). May also include the historical development of policing in cross-cultural perspective.

Prerequisites: Sociology 53.100 and 53.256 ★, Third year standing or permission of the Department.

Lecture and discussion three hours a week.

Sociology-Anthropology 56.361 ★

Food

An examination of food in its relation to socio-political and cultural processes. Topics such as food taboos, restrictions and standards, systems of food production, distribution and consumption, the commodification of food, health, and the body.

Prerequisites: Third-year standing or permission of the Department.

Lectures three hours a week.

Sociology-Anthropology 56.362 ★

Development and Everyday Life

The dynamics of survival in third world countries in relation to globalization and development. Issues such as the role of non-governmental organizations, local and regional survival strategies, social equality and political development.

Precludes additional credit for Sociology-Anthropology 56.360.

Prerequisites: Third year Standing or permission of the Department.

Lectures and discussion three hours a week.

Sociology 53.370

Research Design and Data Analysis

Integrated approach to the problems involved in the analysis of quantitative data. Research design and procedure and statistical inference are studied. It is recommended that Sociology Honours students take this course in the Third year of study.

Precludes additional credit for Economics 43.220 and Psychology 49.300.

Prerequisite: Eligibility for Third-year standing and one of Sociology 53.100, Anthropology 54.100, or Sociology-Anthropology 56.100; or permission of the Department.

Lectures and workshop four hours a week.

Sociology 53.373 ★

Criminal Justice Policy

Description of Canadian criminal justice administration, including prison, parole, probation and community treatment, with an emphasis on conflicting ideologies and the dynamics of policy-making decisions. Consideration is given to the relationship between criminal justice policy and other aspects of social change.

Note: Places in this course are limited; students formally admitted to and registered in the Criminology and Criminal Justice programs will be given priority.

Prerequisites: Sociology 53.255 ★, 53.271 ★ (53.270 prior to 1988-89) and Third-year standing, or permission of the Department.

Lectures three hours a week.

Sociology 53.375 ★

Medical Sociology

Social factors related to health and illness, the illness role, relationships between patients and health practitioners, and the organization of health services. Social psychology of health and illness and the structure of organizations concerned with health care.

Prerequisite: Eligibility for Third-year standing and one of Sociology 53.100, Anthropology 54.100, or Sociology-Anthropology 56.100; or permission of the Department.

Lectures three hours a week.

Sociology 53.381 ★

Sociology of Law

Development of law in the contexts of modernity, the West and capitalism. Writings on law by Durkheim, Weber and Marx; their influence on the development of the sociology of law. (Also listed as Law 51.316 ★.)

Prerequisite: Eligibility for Third-year standing and one of Sociology 53.100, Anthropology 54.100, or Sociology-Anthropology 56.100; or permission of the Department.

Lectures three hours a week.

Sociology 53.382 ★

Social Policy

Introduction to Social Policy in Canadian context. Examines social policy over a broad range of areas. Focus will depend on the specific policy areas that the instructor is researching. The development and outcomes of social policy will be investigated from a number of theoretical perspectives.

Precludes additional credit for Sociology 53.380.

Prerequisites: Sociology 53.100 and Third-year standing or permission of the Department.

Lecture and discussion three hours a week.

Anthropology 54.382 ★

Anthropology and Science Fiction

Examination of anthropological issues through the medium of science fiction. Topics include: language and culture, gender and identity, the evolution of brain and consciousness, religions and symbolic systems, the exploration of space, the future of human societies.

Precludes additional credit for Sociology-Anthropology 56.285 ★ (if taken with the topic Anthropology through Science Fiction).

Prerequisite: Eligibility for Third-year standing and one of Sociology 53.100, Anthropology 54.100, or Sociology-Anthropology 56.100; or permission of the Department.

Lectures three hours a week.

Sociology 53.383 ★

Introduction to Evaluation Research

Program evaluation refers to a set of theories and practices that aid in the rational assessment of the goals and impacts of social programs. Topics may include: current theoretical debates, identification of stakeholders, program monitoring, targeting interventions and impact assessment.

Precludes additional credit for Sociology 53.380.

Prerequisites: Sociology 53.203 and Sociology-Anthropology 56.205 or permission of the Department and Third-year standing.

Lecture and discussion three hours a week.

Sociology-Anthropology 56.383 ★

Anthropology, Art and Everyday Life

A consideration of the range of aesthetic and expressive forms that affect the everyday lives of Indigenous Peoples. Topics may include: the significance of art-making, effects of colonization on Indigenous Peoples' art-making, debates about the commoditization and replication of Indigenous arts for global markets.

Prerequisite: Eligibility for Third-year standing and one of Sociology 53.100, Anthropology 54.100, or Sociology-Anthropology 56.100; or an introductory course in Art History; or permission of the Department.

Lecture three hours a week

Sociology-Anthropology 56.385 ★

Introduction to Cultural Studies

Research and theory in the interdisciplinary area of Cultural Studies. Contemporary cultural change in the advanced industrialized societies and its impact on everyday life.

Precludes additional credit for 56.325 ★ (if taken with the topic "Culture Studies: An Introduction" in 1991-92 and 1992-93).

Prerequisite: Eligibility for Third-year standing and one of 53.100, 54.100, or 56.100; or permission of the Department.

Lectures three hours a week.

Sociology 53.388 ★

Selected Issues in Criminal Justice

This course focuses on conflicting goals among components of the criminal justice system, the theory and practice of correctional institutions and their alternatives, and offenders' rights.

Note: Places in this course are limited; students formally admitted to and registered in the Criminology and Criminal Justice programs will be given priority.

Prerequisites: Sociology 53.255 ★, 53.271 ★ (53.270 prior to 1988-89) and Third-year standing, or permission of the Department.

Lectures three hours a week.

Sociology-Anthropology 56.391 ★

Course-Related Tutorials

See explanatory note on p. 443.

Sociology-Anthropology 56.392 ★

Course-Related Tutorials

See explanatory note on p. 443.

Sociology 53.400 ★

Field Placement: Research and Analysis

Research experience in a professional research setting. Students spend up to one day a week in a research organization, and prepare an assessment of their placement. Enrolment limited. Consult the Honours Sociology Co-ordinator.

Prerequisites: Fourth-year Honours Sociology standing, Sociology 53.370, and permission of the Department.

Anthropology 54.400 ★

Field Placement in Anthropology

Students spend up to one day a week participating in a research organization, and prepare a report on their placement experience. Consult the Honours Anthropology Co-ordinator.

Prerequisites: Fourth-year Honours Anthropology standing and permission of the Department.

Sociology 53.401 ★

Workshop in Applied Sociological Research

Application of sociological theories and methods to practical problems. Issues of research design, data collection, ethics, ownership of data and policy implications may be considered. Students will participate in various aspects of the research process including proposal writing, analysis of secondary data, developing research strategies.

Prerequisites: Open only to students in the Applied Social Policy Research Concentration; other Fourth-year students will be admitted if space is available.

Seminar three hours a week.

Sociology 53.403 ★

Workshop in Advanced Research Design

Research-oriented course that allows students to develop advanced research design skills in qualitative and quantitative techniques. Topics to be covered include philosophy of science, the nature of evidence, strategies of research design and data collection.

Prerequisites: Fourth-year Honours standing and Sociology 53.203, or permission of the Department.

Seminar three hours a week.

Sociology 53.404 ★

Applied Quantitative Data Analysis

The course examines advanced quantitative methods of data analysis, with a focus on the development and application of technical skills. Topics to be examined may include data processing, accessing public information systems, multivariate analysis, and advanced regression techniques.

Prerequisites: Fourth-year Honours standing and Sociology 53.370, or permission of the Department.

Seminar three hours a week.

Sociology 53.405 ★

Workshop in the Use and Abuse of Alcohol and Other Drugs

Topics may include: definitions of addiction; alcohol, other drugs, and crime; groups especially vulnerable to alcohol problems (youth, gay/lesbians, aboriginals); alcohol use and the life cycle; comparative policies in an international perspective; treatment modes and ideologies of treatment.

Prerequisites: Sociology 53.301, Fourth-year standing or permission of the Department.

Seminar three hours a week.

Sociology 53.406

Contemporary Theoretical Sociology

Analysis of sociological theories since the mid-twentieth century such as structuralist, phenomenology and discourse theories, as well as the contributions of modern Marxist and feminist approaches.

Precludes additional credit for Sociology 53.306.

Prerequisites: Fourth-year Honours standing in Sociology, and

Sociology-Anthropology 56.205, (or 56.305), or permission of the Department.

Lectures three hours a week.

Sociology 53.407 ★

Woman Abuse

Provides a comprehensive, critical overview of sociological perspectives on woman abuse. Particular attention will be paid to conceptual, theoretical, methodological and policy issues related to forms of male-to-female victimization.

Prerequisite: Fourth-year standing or permission of the Department.

Seminar three hours a week.

Sociology-Anthropology 56.408 ★

The Social Construction of Time

A comparative analysis of institutions and practices of timing and temporal organization. Topics may include: clocks and the making of the modern world, science, administration and world time systems, non-linear time, generations and biographical time, time discipline in everyday life, techniques and politics of social memory.

Prerequisite: Fourth-year standing or permission of the Department.

Seminar three hours a week

Anthropology 54.409 ★

The Ethnographic Enterprise

Examination of the premises underlying particular cases of empirical work in anthropology. The value of various anthropological paradigms for the solution of standard ethnographic problems. Precludes additional credit for Anthropology 54.410.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Sociology-Anthropology 56.409 ★

The Soul and the Self

The experience of selfhood and identity in social and cultural context. The changing social practices of selfhood and self-formation, such as the confession, the examination, diary-writing, psychiatry. Contemporary medical, moral, religious and psychological practices involved in the definition of the essence of the self.

Prerequisites: Fourth-year standing or permission of the Department.

Seminar three hours a week.

Sociology-Anthropology 56.412 ★

Social Anatomy of the Body

Explores the historical sociology of the body. The relationships among the body, sex and gender, and medical and moral discourses. Regimes of bodily regulation such as self-presentation, identity management, exercise, consumption and self-help.

Prerequisites: Fourth-year standing or permission of the Department.

Seminar three hours per week.

Sociology-Anthropology 56.420 ★

Research Workshop on Aboriginal Peoples and Governmentality

A research workshop on cultural practices of governance and regulation of aboriginal peoples across types of social formation.

Prerequisites: Fourth year Standing or permission of the Department.

Seminar three hours a week.

Sociology 53.424 ★

Studies in the Design Professions

Architecture and industrial design, engineering, interior design and planning. Role in culture and society; education, career and work; comparisons to traditional professions and other art and design occupations; structure of knowledge; nature of design practice.

(Also listed as Architecture 76.424 ★.)

Prerequisite: For Sociology 53.424 ★: Fourth-year standing in Sociology or permission of the Department. For Architecture 76.424 ★: Third-year standing in the B.Arch. program, or Fourth-year standing in Sociology or the School for Studies in Art and Culture (in the combined Architecture/Art History program); or permission of the School of Architecture.

Seminar three hours a week.

Sociology 53.433 ★

Law in Advanced Capitalist Society

The changing role and function of law in modern society with particular reference to advanced capitalist societies. Topics include the welfare state and the use of regulatory law; juridification and legalisation; counter-trends, deregulation, informalism, legal pluralism. (Also listed as Law 51.417 ★.)

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Sociology 53.434 ★

Sociology of Law and Morals

Relations between law and morals in social and historical perspective. Mores; types of law; legitimacy; social operation and effectiveness of law; relation between power and law or morality; human rights; totalitarian law. Theorists include Durkheim, Petrazycki, Weber, Pound, Aubert, Habermas, and Luhmann.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Sociology-Anthropology 56.435 ★

Intimate Interaction II: Touch

Theoretical consideration and applied examination of how touch influences inter-personal communication. Topics include forms, frequency and meanings of touch. Inter-cultural similarities and variations are considered.

Precludes additional credit for Sociology-Anthropology 56.311.

Prerequisite: One of Sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, 53.203 or 54.203, 56.211, 56.312 ★ and Fourth-year standing or permission of the Department.

Seminar three hours per week

Sociology-Anthropology 56.436 ★

Intimate Interaction III: Eyes and Face.

Theoretical consideration and applied examination of how use of the eyes and face act as media of inter-personal communication and influence that process. Inter-cultural similarities and variations are considered. Precludes additional credit for 56.311.

Prerequisite: One of sociology 53.100, Anthropology 54.100, Sociology-Anthropology 56.100 or equivalent, 53.203 or 54.203, 56.211, 56.312 ★ and Fourth-year standing or permission of the Department.

Seminar three hours per week

Sociology 53.440 ★

Environment, Ideology and Social Policy

Development of North American environmental movement. Topics may include: public perceptions of the environment, environmental protection policy, sustainable development, alternative energy sources, environmental impact assessment, technology strategies, legal remedies to environmental problems, the "green" consumer products, community recycling programs.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Sociology 53.443 ★

Selected Problems in the Uses of Sociology and Social Policy Analysis

Selected problems in the relation between sociology and the uses to which it may be put. Topics may include: social criticism, social intervention, social policy and social planning, social engineering, systems analysis and action research.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Sociology-Anthropology 56.444 ★

Globalization and the Transformation of Modern Society

Examination of the phenomenon of globalization as a re-configuration of economies and states, and as a strategy to legitimate particular forms of power and social change. Theoretical arguments will be assessed with reference to Canadian and international research.

Prerequisite: Fourth-year standing or permission of the Department.

Seminar three hours a week.

Sociology-Anthropology 56.450 ★

Advanced Qualitative Research Methodology in Sociology and Anthropology

Study of specific methodological topics in social research. Among the topics that may be included are: archival research, interviewing, observational techniques, content analysis, and life history analysis.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Note: The following courses, Sociology 53.451 ★-56.459 ★, are workshops organized either around a specific research topic or around some policy or interventionist issue. The content is expected to vary from year to year reflecting the current research interests of the instructor. When a workshop is offered, a detailed description will be available. In general, specific area workshops are unlikely to be offered more than once in any two-year period.

Sociology 53.451 ★

Workshop in Demography/Human Ecology

Research- and/or policy-oriented seminar that uses census data or other secondary sources to examine topics in Canadian population, technological development, migration or resource use, depending on the research interests of the instructor.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Sociology 53.452 ★

Workshop on Work and Organizations

Research-oriented seminar that, depending on the research interests of the instructor, may examine the occupational distribution in Canada, ethnicity, gender and work, occupational choice, trade unions, professional organizations, the professions or bureaucracy.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Sociology 53.453 ★

Workshop in Criminology/Deviance

Seminar that, depending on the research interests of the instructor, may consider crime, criminal justice, social processes relating to the implementation of criminal justice policy, or other aspects of criminality or deviance.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Sociology 53.454 ★

Workshop on Sociology of Education

Research- or policy-oriented seminar that, depending on the research interests of the instructor, may examine teacher expectancy effects, student culture, barriers to equality of access or other substantive issues.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Sociology 53.455 ★

Workshop on Stratification and Mobility

Research-oriented seminar that, depending on the research interests of the instructor, may examine differentiation over time or comparatively, patterns of inheritance mobility, or the effects of ethnicity, of gender and past education on the structure of inequality.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Sociology-Anthropology 56.456 ★

Urban Cultures

A research-oriented seminar examining social and cultural aspects of urban life, drawing on the local region as a comparative base. Topics may include: urban-rural mobility, the urban context of social and political theories, the relation between the environment and everyday life.

Precludes additional credit for Sociology 53.456 ★.

Prerequisite: Fourth-year standing or permission of the Department.

Seminar three hours a week.

Sociology 53.457 ★

Workshop in Social Psychology

Research-oriented seminar that, depending on the research interests of the instructor, may focus on one or more of the following topics: attribution theory, cognitive social psychology, conformity, ethno-methodology, psychoanalysis or victimology.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Sociology-Anthropology 56.458 ★

Workshop in Political Sociology-Anthropology

Research-oriented seminar that, depending on the research interests of the instructor, may examine voting behaviour, political movements and parties, national and community elites, relations between society and the state, the prehistoric state, and social conflict.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Sociology-Anthropology 56.459 ★

Workshop in Feminist Research and Analysis

Research-oriented seminar that focuses on current issues in feminist research, depending on the research interests of the instructor.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Sociology-Anthropology 56.460 ★

Studies in Applied Semiology

Relationship between culture and signs, emphasizing text analysis. The scriptures, myths, folk narratives, modern literature and art, the media, pornography, children's drawings are analyzed to illustrate conflicting views on the nature of language.

Precludes additional credit for Anthropology 54.475 ★ (if taken with the same topic).

Prerequisite: Fourth-year Honours standing or permission of the Department.
Seminar three hours a week.

Sociology-Anthropology 56.461 ★

Social Citizenship in Post-Industrial Welfare States

Focuses on the contested nature of social citizenship and using comparative material on post-industrial welfare states, the course explores intellectual traditions and new directions in the argument for equality. Particular attention is paid to the positioning of gender in the conceptualization of social citizenship.

Prerequisite: Fourth-year standing or permission of the Department.

Workshop three hours a week.

Sociology-Anthropology 56.465 ★

Nation, Race, Gender and Citizenship

Exploration of the rights, oppressions and empowerment of groups mobilized around national, racial and ethnic identities. The emergence of distinctive 'citizenship' statuses for indigenous, immigrant and racially-ethnically defined groups of men and women.

Prerequisites: Fourth-year standing or permission of the Department.

Seminar three hours a week.

Anthropology 54.470 ★

Workshop in North American Aboriginal Studies

Cultural persistence, cultural or social change, contemporary conditions and struggles, the position of Indians, Inuit and Métis in Canadian society, and conceptions of aboriginality.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Sociology 53.471 ★

Special Topic in Criminal Justice and Social Policy

Examination of a selected topic in criminal justice and social policy. Topics to be announced in advance each year. (Also listed as Law 51.471 ★ and Social Work 52.471 ★.)

Prerequisite: Permission of the Department.

Hours to be arranged.

Sociology 53.472 ★

Special Topic in Criminal Justice and Social Policy

Examination of a selected topic in criminal justice and social policy. Topics to be announced in advance each year. (Also listed as Law 51.472 ★ and Social Work 52.472 ★.)

Prerequisite: Permission of the Department.

Hours to be arranged.

Sociology 53.473 ★

Special Topic in Criminal Justice and Social Policy

Examination of a selected topic in criminal justice and social policy. Topics to be announced in advance each year. (Also listed as Law 51.473 ★ and Social Work 52.473 ★.)

Prerequisite: Permission of the Department.

Hours to be arranged.

Sociology 53.474 ★

Youth Culture and Juvenile Justice

Establishment and development of the youth justice system in Canada; analysis of juvenile justice policy in relation to crime patterns and youth culture; emphasis on the federal Young Offenders Act and its consequences for the juvenile justice system.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Anthropology 54.475 ★

Workshop in Signs and Symbols

Study of one or more of: psychoanalysis, structuralism, post-structuralism, post-modernism, feminism, critical theory, historical an-

thropology, neuroanthropology, phenomenology.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Anthropology 54.476 ★

Workshop in Development and Underdevelopment

Research-oriented seminar that, depending on the interests of the instructor, may focus on one or more of the following topics: domestic economies, peasant production, forced labour, capital-dominated markets, and theories of underdevelopment and colonialism.

Prerequisite: Fourth-year Honours standing or permission of the Department.

Seminar three hours a week.

Sociology-Anthropology 56.477 ★

Selected Topics in Power and Everyday Life

Examination of a selected topic in power and everyday life. Topics to be announced in advance each year.

Prerequisite: Fourth-year standing or permission of the Department.

Seminar three hours a week.

Sociology-Anthropology 56.479 ★

Women, the State and Everyday Life in the Middle East

The role of the state in shaping the everyday lives of women in the Middle East. Emphasis on the articulation of gender, politics, culture and ideology. The role of colonialism, class divisions, state-nationalism, religious fundamentalism and sexuality. Case studies of specific countries.

Precludes additional credit for Sociology 53.485 ★

Prerequisite: Fourth-year standing or permission of the Department.

Seminar three hours a week.

Sociology 53.480 ★

Masculinity and Power

Examination of masculinity as a social construct; of relationships between masculinity and femininity as they constitute a field of power relations; and of social and discursive practices by which masculinity is re-constituted, historically, and in contemporary times. Precludes additional credit for Sociology 53.480 ★ and Sociology 53.485 ★ (if taken with the topic Men's Studies).

Prerequisite: Fourth-year Honours or graduate standing, or permission of the Department.

Seminar three hours a week.

Sociology 53.482 ★

Sexuality and Human Reproduction

Recent feminist contributions to understanding the political economy of women's sexuality and reproduction. State and medical regulatory practices; feminist contributions to theorizing sexual subjectivity and representations of the female body.

Precludes additional credit for Sociology 53.485 ★ (if taken in 1989-90 and 1990-91).

Prerequisites: Fourth-year Honours standing and Sociology 53.247 or equivalent, or permission of the Department.

Seminar three hours a week.

Sociology 53.485 ★

Contemporary Problems in Sociology

Selected problems in sociology, not ordinarily treated in the regular course program. The choice of topics varies from year to year. Students should check with the Department regarding the topic offered.

Sociology 53.486 ★

Contemporary Problems in Sociology

Selected problems in sociology, not ordinarily treated in the regular course program. The choice of topics varies from year to year. Students should check with the Department regarding the topic offered.

Sociology 53.491 ★

Tutorial in Sociology

See explanatory note, p.443.

Sociology 53.492 ★

Tutorial in Sociology

See explanatory note, p.443.

Anthropology 54.491 ★

Tutorial in Anthropology

See explanatory note, p. 443.

Anthropology 54.492 ★

Tutorial in Anthropology

See explanatory note, p.443.

Sociology 53.493

Directed Research

Directed studies to investigate a particular topic.

Prerequisites: Fourth-year Honours standing in Sociology and permission of the Department. Enrolment is limited to Honours students with a GPA in Sociology of 9.0 or better and a proposal approved by the Honours Committee.

Sociology-Anthropology 56.494 ★

Directed Research in Power and Everyday Life

A directed research project to be selected in consultation with a member of faculty. Research projects will focus on aspects of the intersection of power and everyday life.

Prerequisite: Fourth-year standing in the Concentration in Power and Everyday Life. Students will normally arrange the project topic in consultation with faculty at the end of their Third year.

Contact hours to be negotiated with the research supervisor.

Anthropology 54.495

Honours Practicum

At the end of their final year, Honours candidates are required to present a major research essay. Students present their essay proposals for discussion and criticism to fellow students and faculty, and report periodically upon the paper's progress. Common problems of conceptualization, research design, analysis and interpretation are taken up for consideration.

Prerequisite: Fourth-year Honours standing.

Sociology-Anthropology 56.496 ★

Research Placement in Power and Everyday Life

A supervised research placement. Students undertake a research project directly related to the ongoing activities of an Organised Research Unit at Carleton University or other approved organisation. A paper reporting the results of the research project must be submitted. It will be graded as *Sat/Uns*.

Prerequisite: Fourth-year standing in the Concentration in Power and Everyday Life. Students will normally arrange the research placement in consultation with faculty at the end of their Third year. Contact hours to be negotiated with supervisor

Sociology-Anthropology 56.497 ★

Senior Seminar in Power and Everyday Life

A research seminar focused on the theoretical, methodological and ethical issues arising from directed research projects and research placements in the Concentration in Power and Everyday Life.

Prerequisite: Fourth-year standing or permission of the Department.

Seminar two hours a week.

School of Languages, Literatures and Comparative Literary Studies

Spanish (Arts and Social Sciences)

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Teaching Staff

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Distinguished Research Professor

J. Jurado

Adjunct Research Professor

C.A. Marsden

General Information

Students currently enrolled in degree programs offered by the Discipline of Spanish are governed by the requirements contained in the 1997-98 Undergraduate Calendar.

Minor in Spanish

A Minor in Spanish requires 4.0 credits in Spanish, with a GPA of 6.5 or better, chosen from the list below, in consultation with the Spanish section:

38.115, 38.203 (38.120 may be taken in place of 38.115 and 38.203), 38.205 ★, 38.206 ★ (38.220 may be taken in place of 38.203, 38.205 ★ and 38.206 ★), 38.210 ★, 38.211 ★, 38.301 ★, 38.302 ★.

At least 2.0 credits in the Minor must be completed at Carleton.

Requirement for Breadth, for students in B.A. or B.A.(Honours) degrees

Category for Breadth	Courses in this unit
The temporal dimension of human societies, analyzing times before the present era or societies other than our own	
The artifacts of the imagination in literature and/or other forms, or that addresses the life of the imagination and culture.	All courses in Spanish
The understanding of social, technological and/or natural processes and the ways in which that understanding is obtained in science and social science.	
Matters of human values, ethics and social responsibilities	

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Spanish 38.115

Introductory Spanish

A course for those with no knowledge of Spanish, designed to give the student the fundamentals of spoken and written Spanish, through oral practice, reading and laboratory work. Lectures and laboratory four hours a week.

Spanish 38.120 (2.0 credits)

Intensive Introductory Spanish

For students with little or no Spanish. Students can attain in one year the level normally gained in Spanish 38.115 and 38.203; those not making satisfactory progress will transfer to Spanish 38.115. Lectures and laboratory six hours a week.

Spanish 38.203

Intermediate Spanish

A course for those with at least one year of Spanish. Grammar review, extensive reading, guided composition, laboratory work. Prerequisite: Spanish 38.115 or equivalent. Lectures and laboratory four hours a week.

Spanish 38.204

Intensive Intermediate Spanish

A course for potential Majors and for those with OAC Spanish or equivalent. Review of grammar and some advanced syntax; extensive reading, discussion and composition. Prerequisites: Spanish 38.115 or equivalent, and permission of the School. With special permission of the School, students enrolled in this course may take Spanish 38.205 ★ simultaneously.

Spanish 38.205 ★

Spanish Conversation

Conversation and discussion of current problems, supplemented by occasional written work. Prerequisite: Spanish 38.120 or 38.203 or 38.204 or permission of the School. Three hours a week.

Spanish 38.206 ★

Spanish Composition

A course designed to consolidate the linguistic knowledge attained in Spanish 38.203 and to inculcate the elements of a good Spanish style. Prerequisite: Spanish 38.120 or 38.203 or 38.204 or permission of the School. Lectures and discussion three hours a week.

Spanish

Spanish 38.210 ★

Spanish Civilization

The cultural heritage of Spain in its social and geographical contexts. Prerequisite: Spanish 38.120 or 38.203 or 38.204 or permission of the School.

Lectures and discussion three hours a week.

Spanish 38.211 ★

Spanish-American Civilization

The cultural heritage of Spanish America in its social and geographical contexts.

Prerequisite: Spanish 38.120 or 38.203 or 38.204 or permission of the School.

Lectures and discussion three hours a week.

Spanish 38.220 (2.0 credits)

Intensive Advanced Spanish

A course designed for potential majors who have taken 38.115 (or an equivalent introductory course), it combines the material given in 38.203, 38.205 ★ and 38.206 ★. Students not making satisfactory progress will be transferred to a different, non-intensive course at the appropriate level.

Precludes additional credit for Spanish 38.120, 38.203, 38.205 ★, 38.206 ★.

Lectures and laboratory seven hours a week during the Fall term, six hours a week during the Winter term.

Spanish 38.235

An Introduction to Hispanic Theatre

A study of the theory and practice of dramatic production in Spain and Spanish America together with detailed analysis and interpretative reading of representative plays. Students in the course are required to participate in the staging of a play.

Prerequisite: Spanish 38.120 or 38.203 or 38.204 or permission of the School.

Spanish 38.301 ★

Advanced Oral Spanish

An advanced sequel to Spanish 38.205 ★.

Prerequisite: Spanish 38.205 ★ or permission of the School.

Conversation and discussion three hours a week.

Spanish 38.302 ★

Advanced Spanish Composition

An advanced sequel to Spanish 38.206 ★.

Prerequisite: Spanish 38.206 ★ or permission of the School.

Lectures and discussion three hours a week.

Spanish 38.303 ★

Spanish Phonetics and Phonology

A descriptive study of the sounds and sound patterns of Spanish. Practical exercises, written and oral. Recommended for teachers.

Prerequisites: Spanish 38.205 ★ and 38.206 ★ or permission of the School.

Lectures and discussion three hours a week.

Spanish 38.305

Intensive Oral Spanish

An intensive course in Spanish conversation which, being offered only in a Spanish-speaking country, also provides an introduction to Hispanic culture. Students who satisfactorily complete this course are ineligible to enroll subsequently in Spanish 38.205 ★ or 38.301 ★. Compulsory attendance at all classes and participation in all activities. Prerequisite: Spanish 38.203 or 38.204 or 38.120 or permission of the School.

Spanish 38.320 ★

The Golden Age I

A study of representative works of Spanish literature of the Renaissance and Early Baroque periods.

Prerequisite: Spanish 38.210 ★ or 38.235 or permission of the School.

Lectures and discussion three hours a week.

Spanish 38.321 ★

The Golden Age II

A study of representative works of Spanish literature of the Baroque period.

Prerequisite: Spanish 38.210 ★ or 38.235 or permission of the School.

Lectures and discussion three hours a week.

Spanish 38.330 ★

Nineteenth-Century Spanish Literature

A study of representative works of the major movements (Romanticism, costumbrismo, Realism and Naturalism) and authors of Spanish literature of the nineteenth century.

Prerequisite: Spanish 38.210 ★ or 38.235 or permission of the School.

Lectures and discussion three hours a week.

Spanish 38.331 ★

Twentieth-Century Spanish Literature

A study of representative works of Spanish literature from the Generation of 1898 on.

Prerequisite: Spanish 38.210 ★ or 38.235 or permission of the School.

Lectures and discussion three hours a week.

Spanish 38.350 ★

Spanish-American Literature, 1500-1888

A study of representative works of Spanish-American literature of the Colonial Period and the nineteenth century prior to Modernism.

Prerequisite: Spanish 38.211 ★ or 38.235 or permission of the School.

Lectures and discussion three hours a week.

Spanish 38.351 ★

Spanish-American Literature from Modernism to the Present

A study of representative works of Spanish-American literature since 1888.

Prerequisite: Spanish 38.211 ★ or 38.235 or permission of the School.

Lectures and discussion three hours a week.

Spanish 38.402 ★

Theories of Literature

Theoretical discussion of literature from about 1920 to the present. Offered by the School of Comparative Literary Studies as Theories of Literature 17.402 ★. Spanish students will register in Spanish 38.402 ★, and will use Hispanic texts for exercises of practical application.

Prerequisite: Permission of the School.

Seminar three hours a week.

Spanish 38.415 ★

Medieval Spanish Literature from the Origins through 1300

A study of major works of Spanish literature from the earliest times through the thirteenth century.

Prerequisite: Spanish 38.210 ★ or 38.235 or permission of the School.

Students will normally have taken a literature course at the 300-level before enrolling in this course.

Seminar three hours a week.

Spanish 38.416 ★

Medieval Spanish Literature, 1300-1500

A study of major works of Spanish literature of the fourteenth and fifteenth centuries.

Prerequisite: Spanish 38.210 ★ or 38.235 or permission of the School.

Students will normally have taken a literature course at the 300-level before enrolling in this course.

Seminar three hours a week.

Spanish 38.420 ★

Cervantes

A study of Cervantes and his age, with particular reference to Don Quixote.

Prerequisites: Spanish 38.320 ★ and 38.321 ★ or permission of the School.

Seminar three hours a week.

Spanish 38.430 ★

Modern Spanish Novel

Analysis and interpretation of works by major Spanish novelists from the beginnings of Realism in the nineteenth century up to the Civil War in 1936.

Prerequisites: Spanish 38.330 ★ and 38.331 ★, or permission of the School.

Seminar three hours a week.

Spanish 38.431 ★

Contemporary Spanish Novel

Analysis and interpretation of works by major Spanish novelists from the Civil War to the present.

Prerequisites: Spanish 38.330 ★ and 38.331 ★ or permission of the School.

Seminar three hours a week.

Spanish 38.435 ★

Modern Spanish Drama

Analysis and interpretation of works by major Spanish playwrights of the nineteenth and early twentieth centuries, together with study of related dramatic theory.

Prerequisites: Spanish 38.330 ★ and 38.331 ★ or permission of the School.

Seminar three hours a week.

Spanish 38.436 ★

Contemporary Spanish Drama

Analysis and interpretation of works by major Spanish playwrights from the Civil War to the present, together with study of related dramatic theory.

Prerequisites: Spanish 38.330 ★ and 38.331 ★ or permission of the School.

Seminar three hours a week.

Spanish 38.440 ★

Modern Spanish Poetry

A study of Spanish poetry and poetics of the nineteenth and early twentieth centuries.

Prerequisites: Spanish 38.330 ★ and 38.331 ★ or permission of the School.

Seminar three hours a week.

Spanish 38.441 ★

Contemporary Spanish Poetry

A study of Spanish poetry and poetics from the Generation of 1927 to the present.

Prerequisites: Spanish 38.330 ★ and 38.331 ★ or permission of the School.

Seminar three hours a week.

Spanish 38.460 ★

Twentieth-Century Spanish-American Novel I

Analysis and interpretation of works by major Spanish-American novelists of the first half of the twentieth century.

Prerequisites: Spanish 38.350 ★ and 38.351 ★ or permission of the School.

Seminar three hours a week.

Spanish 38.461 ★

Twentieth-Century Spanish-American Novel II

Analysis and interpretation of works by major Spanish-American novelists of the second half of the twentieth century.

Prerequisites: Spanish 38.350 ★ and 38.351 ★ or permission of the School.

Seminar three hours a week.

Spanish 38.470 ★

Twentieth-Century Spanish-American Poetry I

A study of the principal tendencies in twentieth-century Spanish-American poetry with special emphasis on the modernist poets, the post-modernist poetisas and the creationism of Vicente Huidobro.

Prerequisites: Spanish 38.350 ★ and 38.351 ★ or permission of the School.

Seminar three hours a week.

Spanish 38.471 ★

Twentieth-Century Spanish-American Poetry II

A study of the principal tendencies in twentieth-century Spanish-American poetry, with special emphasis on the social poetry of César Vallejo, Nicolás Guillén and Pablo Neruda.

Prerequisites: Spanish 38.350 ★ and 38.351 ★ or permission of the School.

Seminar three hours a week.

Spanish 38.480 ★

Twentieth-Century Spanish-American Theatre I

Analysis and interpretation of plays by major Spanish-American playwrights of the first half of the twentieth century. Theatrical forms and dramatic movements will include the sainete, the grotesco criollo, realism, the Independent Theatre, and anti-realistic experiments.

Prerequisites: Spanish 38.350 ★ and 38.351 ★ or permission of the School.

Seminar three hours a week.

Spanish 38.481 ★

Twentieth-Century Spanish-American Theatre II

Analysis and interpretation of plays by major Spanish-American playwrights since 1950. Theatrical forms and dramatic movements will include Critical Realism, Epic Theatre, Expressionism, and the Theatre of the Absurd.

Prerequisites: Spanish 38.350 ★ and 38.351 ★ or permission of the School.

Seminar three hours a week.

Spanish 38.490

Seminar on a Special Topic

Designed for Honours students normally in their final year, or for Graduate students.

Seminar three hours a week.

Spanish 38.491 ★

Seminar on a Special Topic

Designed for Honours students normally in their final year, or for graduate students.

Prerequisites: Spanish 38.350 ★ and 38.351 ★, or permission of the School.

Seminar three hours a week.

Spanish 38.492 ★

Special Studies

From time to time members of the School form small groups to study certain problems or aspects of Spanish literature in greater depth than is possible in other courses. Interested students should consult the School.

Seminar three hours a week.

• Portuguese Course

Portuguese 38.116

Introductory Portuguese

A course designed to provide the student with the fundamentals of Portuguese grammar, a basic vocabulary and speaking knowledge of Portuguese. Students who have taken courses in other Romance languages should make considerable progress.

Systems and Computer Engineering (Engineering)

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Chair, R.A. Goubran

Teaching Staff

Professor Emeritis

David C. Coll, M.Eng. (McGill), Ph.D. (Carleton), F.I.E.E.E., P.Eng.

Professors

Raymond J.A. Buhr, B.Sc. (Queen's), M.Sc. (Saskatchewan), Ph.D. (Cambridge) • **John W. Chinneck**, B.A.Sc., M.A.Sc., Ph.D. (Waterloo) P.Eng. • **M.S. El-Tanany**, B.Sc., M.Sc. (Cairo), Ph.D. (Carleton) • **David D. Falconer**, B.A.Sc. (Toronto), Ph.D. (Massachusetts Institute of Technology), P.Eng. • **Monique Frize**, B.A.Sc. (Ottawa), M.Phil., D.I.C. (Imperial), M.B.A. (Moncton), Doctorate (Erasmus) • **Donald Gerwin**, B.S. (Carnegie-Mellon), M.S. (Case Western Reserve), Ph.D. (Carnegie-Mellon) • **R.H.M. Hafez**, B.Sc., M.Sc. (Alexandria), Ph.D. (Carleton) • **Samy A. Mahmoud**, B.Sc. (Ain Shams), M.Eng., Ph.D. (Carleton), P.Eng. • **B. Pagurek**, B.A.Sc., M.A.Sc., Ph.D. (Toronto), P.Eng. • **J.S. Riordon**, B.Eng., M.Eng. (McGill), D.I.C. (Imperial), Ph.D. (London), F.E.I.C., P.Eng. • **C.M. Woodside**, B.A.Sc. (Toronto), Ph.D. (Cambridge), P.Eng.

Associate Professors

A.J. Bailetti, B.S. (Univ. National de Ingenieria), M.B.A., Ph.D. (Cincinnati) • **John R. Callahan**, B.Sc. (Carleton), M.A., Ph.D. (Toronto) • **Rafik A. Goubran**, B.Sc., M.Sc. (Cairo), Ph.D. (Carleton), P.Eng. • **Ioannis Lambadaris**, B.A. (Aristotelian), M.Sc. (Brown), Ph.D. (Maryland) • **S. Majumdar**, B. Eng. (Jadavpur), M.Eng. (Politecnico Di Torino), M.Sc., Ph.D. (Saskatchewan) • **Dorina C. Petriu**, Dipl. Eng. (Institute of Timisoara, Romania), Ph.D. (Carleton) • **Jerome Rolia**, B.C.S. (Carleton), M.Sc., Ph.D. (Toronto) • **H.M. Schwartz**, B.Eng. (McGill), M.Sc., Ph.D. (Massachusetts Institute of Technology)

Assistant Professors

A.H. Banihashemi, B.Sc. (Isfahan), M.Sc. (Tehran), Ph.D. (Waterloo) • **M. Devetsikiotis**, (Dipl. Elect. Engin. (Thessaloniki), M.Sc., Ph.D. (North Carolina State University)) • **Thomas Kunz**, Diplom-Wirtschaftsinformatiker, Dr. Ing. (Technical University of Darmstadt, Germany) • **I.D. Marsland**, B.Sc. (Queens), M.A.Sc., Ph.D. (British Columbia) • **Trevor Pearce**, B.Eng., M.Eng. (Carleton), Ph.D. (Queen's) • **D. Rossille**, Eng. Dipl. (Universite de Rennes), M.Sc. (University of Wales), Ph.D. (Universite de Nice-Sophia Antipolis) • **H. Yanikomeroglu**, B.Sc. (Middle East Technical University), M.A.Sc., Ph.D. (Toronto)

Instructor

Donald L. Bailey, B.Eng., M.Eng. (Carleton)

Adjunct Research Professors

S. Abu-Hakima, National Research Council • **G.D. Boudreau**, MPR Teltech Ltd. • **R.J.C. Bultitude**, Communications Research Centre • **S.N. Crozier**, Communications Research Centre • **S. Heeralall**, Nortel • **G.M. Karam**, AT&T Bell Laboratories • **R.D. Peacocke**, Nortel • **S. Periyalwar**, Nortel • **L. Strawczynski**, Nortel • **C.R. Walker**, Children's Hospital of Eastern Ontario • **Y. Wu**, Communications Research Centre

The Departments of Electronics and Systems and Computer Engineering offer courses in Communications Engineering, Computer Systems Engineering and Electrical Engineering programs (please see p. 93, p. 95 and p. 96).

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Engineering 94.110 ★

Introduction to Object-Oriented Computing

A first course in problem solving in the context of object-oriented programming. Programming with Java: control structures, data abstraction, classes, class relationships, inheritance, polymorphism. Tracing and visualizing program execution. Testing and debugging. Program style, documentation, reliability.

Prerequisites: Engineering 91.166 ★.

Lectures three hours a week, laboratory one hour a week.

Engineering 94.111 ★

Object-Oriented Software Development

Principles and practice of three paradigms for developing object-oriented software: developing classes from scratch, reuse of existing classes, and incremental extension of frameworks.

Design: identifying classes, responsibilities and collaborations. Introduction to UML for describing program designs.

Prerequisites: additional credit for Engineering 94.204 ★.

Prerequisite: Engineering 94.110 ★.

Lectures three hours a week, laboratory one hour a week.

Engineering 94.112 ★

Foundations of Systems Programming

Problem solving and program design, emphasizing the computing abstractions underlying real-time system and operating system development. Procedural and data abstraction in C++. Recursion, pointers, linked lists.

Prerequisites: additional credit for Engineering 91.166 ★.

Prerequisite: Engineering 94.110 ★.

Lectures three hours a week, laboratory one hour a week.

Engineering 94.201 ★**Foundations of Computer Systems**

The relationships between high-level languages (including object-oriented languages), operating systems, and computer system architecture. Representation of data; basic computer organization: CPU and memory; instruction encoding and execution; assemblers and linkers; code generated by compilers; runtime support.

Prerequisite: Engineering 91.166 ★ or 94.112 ★.

Lectures three hours a week, laboratory two hours a week.

Engineering 94.202 ★**Program Design and Construction**

In-depth experience in the design and construction of computer programs involving data structures and different programming paradigms. Data structures, formal specification, abstract data types, graphs, recursion, finite state machines and object-oriented programming.

Precludes additional credit for Engineering 94.210 ★ and 94.302.

Prerequisite: Engineering 91.166 ★.

Lectures three hours a week, laboratory two hours a week.

Engineering 94.203 ★**Introduction to Real-Time Systems**

Principles of event-driven systems. Review of computer organization. Parallel and serial interfaces, programmable timer. Input/output methods: polling, interrupts. Real-time issues: concurrency, mutual exclusion, buffering. Introduction to concurrent processes, real-time kernels.

Precludes additional credit for Engineering 94.303 ★ and 94.306 ★.

Prerequisite: Engineering 94.201 ★.

Lectures three hours a week, laboratory two hours a week.

Engineering 94.204 ★**Object-Oriented Programming Laboratory**

Principles and practice of three software development paradigms with an object-oriented programming language: developing classes from scratch, reuse of existing classes, incremental extension of frameworks. Development of expertise in designing, implementing, and testing industrial-quality, reusable code.

Precludes additional credit for Engineering 94.111 ★.

Prerequisite: Engineering 94.202 ★.

Lectures two hours a week, laboratory three hours a week.

Engineering 94.210 ★**Algorithms and Data Structures**

Specification and design of abstract data types and their implementation as Java classes: stacks, queues, trees, tables, graphs. ADTs as elements of program designs. Common and useful examples: simulation, parsing, and state machines. Introduction to the analysis of algorithms.

Precludes additional credit for Engineering 94.202 ★.

Prerequisites: Engineering 94.111 ★ and 94.112 ★.

Lectures three hours a week, laboratory two hours a week.

Engineering 94.211 ★**Object-Oriented Programming and Design Laboratory**

Development of expertise in designing, implementing, and testing industrial-quality, reusable code through individual and team projects. Applying and extending previously acquired knowledge of patterns, frameworks, UML, iterative and incremental development, Java and C++ to medium- and large-scale systems.

Prerequisite: Engineering 94.210 ★ or Engineering 94.204 ★.

Lectures two hours a week, laboratory three hours a week.

Engineering 94.250 ★**Signals and Systems**

Signals: energy and power signals, discrete-time and continuous. Linear systems and convolution. Fourier Transform; complex Fourier series; signal spectral properties and bandwidth. Laplace transform and transient analysis. Transfer functions, block diagrams. Baseband and passband signals, with applications to communications systems.

Precludes additional credit for Engineering 94.360 ★.

Prerequisite: Mathematics 69.204 ★.

Lectures three hours a week, problem analysis three hours alternate weeks.

Engineering 94.301 ★**Operating Systems and Data Bases**

Operating systems and data bases treated from a common perspective. Management of CPU, processes, memory, files, and data. Implications of concurrency. Concurrent programming, including interprocess communication in distributed systems. Data models and query languages.

Precludes additional credit for Engineering 94.401 ★.

Prerequisites: Engineering 94.202 ★ or 94.210 ★, and 94.203 ★.

Lectures three hours a week.

Engineering 94.306 ★**Computer Organization**

Computer organization: processor, memory, input/output, instruction encoding and execution. Representation of data, assembly language programming. Devices: display, parallel and serial interfaces, programmable timer. Input/output methods: polling and interrupts.

Precludes additional credit for Engineering 94.201 ★, 94.203 ★, and 94.303 ★. May not be taken for credit by students in Computer Systems Engineering.

Prerequisites: Engineering 91.166 ★ and 97.267 ★.

Lectures three hours a week, laboratory two hours a week.

Engineering 94.310 ★**Systems Analysis and Design**

Creating requirements specifications prior to designing and implementing complex software systems. Software development lifecycles, role of requirements analysis; functional decomposition, dataflow modelling; database modelling, entity-relationship diagrams; finite state machines; object-oriented analysis; use cases, use case maps; project management; introduction to software design.

Prerequisite: Engineering 94.204 ★ or 94.211 ★.

Lectures three hours a week.

Engineering 94.311 ★**Programming Languages**

Principles underlying different kinds of programming languages (procedural, functional, logic programming) and their semantics. Overview of machinery needed for language support (compilers, interpreters and run-time systems).

Prerequisite: Engineering 94.211 ★.

Lectures three hours a week, laboratory three hours alternate weeks.

Engineering 94.320 ★**Industrial Engineering**

Techniques of operations research for decision-making in complex engineering systems. Linear programming, network models, PERT, integer programming, dynamic programming, queuing systems and inventory models. Problem-solving is emphasized.

Precludes additional credit for Business 42.230 ★, Economics 43.404 ★, or Mathematics 69.381 ★.

Prerequisites: Mathematics 69.104 ★ and 69.114 ★, and Engineering 91.166 ★ or 94.110 ★.

Lectures three hours a week.

Engineering 94.333 ★**Real-Time Concurrent Systems**

Principles and practice of a systems engineering approach to the development of software for real time, concurrent, distributed systems. Designing to achieve concurrency, performance, and robustness, using visual notations. Converting designs into programs and viewing programs in design terms. Major course project.

Prerequisites: Engineering 94.310 ★ and 94.301 ★.

Lectures two hours a week, laboratory three hours a week.

Engineering 94.352 ★

Introduction to Communications Software

Finite state machines and related models. Layered communication models and protocols. Modern programming tools such as C++ and JAVA in programming examples from LAN Logical Link Layer and Medium Access Control Layer Protocols, and the ISO/OSI Physical and Data Link Layer Protocols.

Lectures three hours a week, problem analysis three hours alternate weeks.

Engineering 94.351 ★

Communication Theory

Signals and linear systems; review of Fourier series; Fourier transforms; power spectral density and correlation; sampling theory; amplitude, frequency, and phase modulation systems; representation of narrow-band noise; noise in modulation systems; phase-locked loops; noise figure and temperature; cascaded systems.

Prerequisites: Mathematics 69.375 ★ and Engineering 94.260 ★ or 94.360 ★, and Mathematics 69.352 ★ (to be taken concurrently).

Lectures three hours a week, laboratory three hours alternate weeks.

Engineering 94.353 ★

Communication Theory II

Amplitude Modulation. Frequency Modulation. Performance of AM and FM in noise. Digital modulation: ASK, FSK, PSK. Optimal reception, probability of error on the AWGN channel.

Precludes additional credit for Engineering 94.351 ★ or 94.460 ★.

Prerequisite: Engineering 94.250 ★ and Mathematics 69.265 ★.

Lectures three hours a week, laboratory three hours alternate weeks.

Engineering 94.360 ★

Systems and Simulation

Properties of linear systems. Linear dynamic models of engineering systems. Applications of the Laplace transform. Transfer functions. Block diagrams. Frequency and time response. System simulation with digital computers.

Precludes additional credit for Engineering 94.260 ★.

Prerequisites: Mathematics 69.105 ★ or 69.201, and Engineering 91.111 ★.

Lectures three hours a week, laboratory three hours a week.

Engineering 94.361 ★

Microprocessor Systems

Microprocessor-based system design for different microprocessor families. Microprocessors: internal organization, instruction sets, address generation, pin-outs, bus cycles, signalling waveforms. Interfacing memory and I/O devices. Interrupt structures, direct memory access. Floating point coprocessors. System bus standards. Introduction to DSPs.

Precludes additional credit for Engineering 97.461 ★.

Prerequisites: Engineering 97.267 ★, and Engineering 94.203 ★, 94.303 ★, or 94.306 ★.

Lectures three hours a week, laboratory three hours alternate weeks.

Engineering 94.395 ★

Professional Practice

Presentations by faculty and external lecturers on the Professional Engineers Act, professional ethics and responsibilities, practice within the discipline and its relationship with other disciplines and to society, health and safety, environmental stewardship, principles and practice of sustainable development. Communication skills are emphasized. (Also listed as Engineering 97.395 ★.)

Precludes additional credit for Engineering 82.495 ★ and 86.495 ★.

Prerequisite: Third-year registration.

Lectures three hours a week.

Engineering 94.401 ★

Operating Systems

Introduction to operating system principles. Structure of an operating system; management of CPU, processes, and memory; deadlock problems, file systems. Concurrent programming.

Precludes additional credit for Engineering 94.301 ★.

Prerequisites: Engineering 94.202 ★ or 94.210 ★, and Engineering 94.203 ★, 94.303 ★, or 94.306 ★.

Lectures three hours a week.

Engineering 94.405 ★

Discrete Simulation and its Applications

Simulation as a problem solving tool. Random variate generation, general discrete simulation procedure: event table and statistical gathering. Analyses of simulation data: point and interval estimation. Confidence intervals. Overview of modelling, simulation, and problem solving using SIMSCRIPT, MODSIM, and other languages.

Prerequisite: Fourth-year registration or Third-year registration in Software Engineering or permission of the Department.

Lectures three hours a week, laboratory one hour a week.

Engineering 94.411 ★

Software Validation, Verification and Testing

Techniques for the systematic testing of software systems. Software validation and verification, software debugging, quality assurance, measurement and prediction of software reliability. Emphasis on the treatment of these topics in the context of real-time and distributed systems.

Prerequisites: Engineering 94.211 ★ and 94.310 ★.

Lectures three hours a week.

Engineering 94.412 ★

Performance Engineering of Computer and Software Systems

Techniques based on measurements and models, for predicting and evaluating the performance of computer systems. Instrumentation. Simple queueing models and approximations. Techniques for modifying software designs to improve performance.

Prerequisites: Mathematics 69.352 ★, Engineering 94.301 ★ or 94.401 ★, and 94.405 ★

Engineering 94.415 ★

Engineering Management

Introduction to engineering management: management of new products, management of manufacturing processes, management of the linkages between new products and manufacturing processes. Current theories, concepts and techniques are stressed, using a combination of readings, cases and guest speakers.

Prerequisite: Fourth-year registration.

Lectures three hours a week.

Engineering 94.416 ★

Software Product Management

Stages of the life cycle of software products and their implications for architecture definition, requirements specification, variety, target market segmentation, adoption, roll-out plans, documentation, maintenance, skills, building prototypes, testing, feature prioritization, quality and tools infrastructures.

Prerequisite: Engineering 94.310 ★ or equivalent.

Lectures three hours a week.

Engineering 94.417 ★

Software Business

Establishing and growing businesses anchored on software design and development. Models for software business; partnerships with suppliers and customers; distribution; raising money; intellectual property protection; evolving core products and sources of competitive advantage; alignment among the business model, infrastructures, and software development.

Prerequisite: Fourth-year registration in Engineering or Computer Science.

Lectures three hours a week.

Engineering 94.445 ★**Introduction to Digital Signal Processing**

Discrete time signal and system representation: time domain, z-transform, frequency domain. Sampling theorem. Digital filters: design, response, implementation, computer-aided design. Spectral analysis: the discrete Fourier transform and the FFT. Applications of digital signal processing.

Prerequisite: Engineering 94.260 ★ or 94.360 ★

Lectures three hours a week, laboratory three hours alternate weeks.

Engineering 94.454 ★**Distributed Network Processing**

Software aspects of distributed networks. Client-server systems. Internet and the WWW. LAN's and WAN's, routing protocols. Transportable software, JAVA applets. Use of modern software tools in communication network monitoring and analysis. Network management.

Prerequisite: Engineering 94.352 ★.

Lectures three hours a week, laboratory three hours alternate weeks.

Engineering 94.455 ★**Automatic Control Systems I**

Review of Laplace transform techniques. Effects of feedback: frequency response, pole-zero positions. Compensation: root locus, Bode plots. State variables: formulation, solution of linear systems, examples of simple second-order non-linear systems. Discrete time systems: z-transforms. Signal reconstruction.

Prerequisites: Mathematics 69.201 or 69.204 ★, and Engineering 94.260 ★ or 94.360 ★.

Lectures three hours a week, laboratory three hours alternate weeks.

Engineering 94.457 ★**Architecture of Computer Systems**

History of computers: evolution of concepts, influence of technology, techniques to increase performance. Detailed analysis and design of ALUs, control units, memory systems. Multiprocessor systems, pipeline and array processing. Scalable, superscalar, RISC, CISC, fault tolerant, and digital signal processing architectures.

Prerequisite: Engineering 97.267 ★ or 97.367 ★.

Lectures three hours a week.

Engineering 94.460 ★**Digital Communications**

Review of probability, random variables, signal representation. Pulse code modulation, other digital waveform coding techniques. Physical layer of data communications. Baseband data transmission: Nyquist criterion, filtering, optimal receiver, probability of error. Digital modulation techniques, performance. Synchronization. Introduction to information theory. Error detection and correction.

Precludes additional credit for Engineering 94.353 ★ and 94.464 ★.

Prerequisite: Engineering 94.351 ★.

Lectures three hours a week, laboratory three hours alternate weeks.

Engineering 94.462 ★**Introduction to Computer Communications**

Layered protocol architectures, OSI. Physical media, physical layer interfaces, data transmission. Data-link protocols, multiplexing, polling, LANs, IEEE 802 standards, performance. Switched Ethernet, FDDI, bridges. Wide area networks, packet switching networks, X.25. Frame relay, internetworking, DoD protocols, TCP, UDP. ATM LANs, adaptation layers, traffic issues.

Prerequisite: Fourth-year registration in Electrical or Computer Systems Engineering.

Lectures three hours a week, laboratory three hours alternate weeks.

Engineering 94.464 ★**Digital Communication Theory**

Advanced topics in digital communications. Error control coding. Bandwidth-efficient modulation. Trellis coding. Synchronization, phase locked loops. Selected topics of current interest: spread spec-

trum; digital wireless communications.

Precludes additional credit for Engineering 94.460 ★.

Prerequisite: Engineering 94.353 ★.

Lectures three hours a week, laboratory three hours alternate weeks.

Engineering 94.470 ★**Telecommunications Engineering**

Telecommunications as a national and international infrastructure. Systems view of network architecture: transmission, switching, signalling, and teletraffic; ISDN; network planning, management and control; global telecommunications, International Telecommunication Union; telecommunications industry as business enterprise (R & D, manufacturing, operations, human factors); standards: role of government, regulation and competition.

Prerequisites: Engineering 94.351 ★ or 94.353 ★.

Lectures three hours a week, laboratory three hours alternate weeks.

Engineering 94.471 ★**Communication Systems Analysis and Design**

Project-oriented level experience in the design of communication systems to meet user requirements. Lectures on queuing theory and teletraffic analysis; system specification and design: requirements analysis, solution alternatives, evaluation of alternative technologies, design, costing, implementation, test.

Prerequisite: Registration in Fourth-year Communications Engineering.

Lectures two hours a week, laboratory four hours a week.

Engineering 94.480 ★**Software Engineering**

Review of software lifecycles and requirements analysis. Software design, with emphasis on methods for real-time systems. Testing, verification and validation, quality assurance and control. Project planning and management. Maintenance and configuration management. Software reuse during design and maintenance.

Prerequisites: Engineering 94.310 ★ and 94.333 ★.

Lectures three hours a week, laboratory three hours alternate weeks.

Engineering 94.485 ★**Computer Systems Design Laboratory**

Developing professional-level expertise in selected, important areas of the field by applying, honing, integrating, and extending previously acquired knowledge in team projects in the laboratory. Lecture periods are devoted to new knowledge required for the selected areas, to project-related issues, and to student presentations.

Prerequisites: Engineering 94.361 ★ or 97.461 ★, and 94.480 ★ and registration in Fourth-year Computer Systems Engineering. (Students are encouraged to enrol in both Engineering 94.480 ★ and 94.485 ★ in the same academic year.)

Lectures two hours a week, laboratory four hours a week.

Engineering 94.486 ★**Software Engineering Laboratory**

Applying the full spectrum of engineering and programming knowledge acquired in the program through team projects in the laboratory. Practice in doing presentations and reviews. Lectures will discuss software engineering issues as they relate to the projects, from a mature point of view.

Prerequisite: Engineering 94.480 ★

Lectures two hours a week, laboratory four hours a week.

Engineering 94.495**Engineering Project**

Students are required to complete a major project in engineering analysis, design, development, or research. The objective is to develop initiative, self-reliance, creative ability, and engineering judgement. The results are submitted in a comprehensive report with appropriate drawings, charts, bibliography, etc.

Engineering 94.496 ★

Special Topics in Electrical and Computer Systems Engineering

At the discretion of the Department, a course dealing with selected advanced topics of interest to Electrical and Computer Systems engineering students may be offered. (Also listed as Engineering 97.496 ★).

Prerequisite: Permission of the Department.

Engineering 94.497

Engineering Project

Students are required to complete a major project in engineering analysis, design, development, or research. The objective is to develop initiative, self-reliance, creative ability, and engineering judgement. The results are submitted in a comprehensive report with appropriate drawings, charts, bibliography, etc.

Engineering 94.498

Engineering Project

Students are required to complete a major project in engineering analysis, design, development, or research. The objective is to develop initiative, self-reliance, creative ability, and engineering judgement. The results are submitted in a comprehensive report with appropriate drawings, charts, bibliography, etc.

Technology, Society, Environment Studies (Science)

460 Steacie Building
Telephone: 520-4483
Fax: 520-4389

Academic Administration

Chair, Peeter Kruus (Technology, Society, Environmental Studies and Chemistry)

Members

B. Burns (Industrial Design), J. Carson (Library), D. Deugo (Computer Science), S. Ferris (Economics), B. Jarosz (Physics), W. Lawson (Business), W. Parker (Environmental Engineering), J. Taylor (History)

Teaching Staff

Professor

Peeter Kruus, B.Sc. (Toronto), Lic.Tech. (Denmark), Ph.D. (Toronto)

Adjunct Research Professors

Satya Brink (Human Resources Development Canada) • **John Buschek** (Publisher) • **R.W. Morrison** (Natural Resources Canada) • **C.G. Widstrand** (Consultant)

Sessional Lecturers

J. Buschek, B.S. (Syracuse), Ph.D. (Wisconsin) • **J. Carson**, B.A. (Bishop's), B.A. (Ottawa), M.A. (Western Ontario), M.I.S. (Western Ontario) • **R.W. Morrison**, B.Eng. (McGill), Ph.D. (Paris)

General Information

It is becoming increasingly apparent that:

1. The future of the Western societies depends on their ability to cope with the complex problems resulting from the interactions of Technology, Society and the Environment (TSE).
2. The effectiveness of the democratic political process is contingent upon the perception and comprehension of these phenomena by the electorate.
3. Because of the complexity and the wide range of the problems involved, their understanding cannot be gained through specialized education in traditional disciplines. A multidisciplinary approach is required.

The multidisciplinary courses listed below, offered under the direction of the TSE Studies Committee, seek to fulfil this need. They are designed to provide students from all faculties with a solid basis for understanding the major problems of industrialized society, and with firsthand appreciation through research project work, of the complexities involved. The TSE courses are open to all students beyond the First year; these courses are especially recommended for students at the Third- and Fourth-year levels. Students enrolled in three-year programs, however, who would like to take these courses are encouraged to take TSE 59.300 in the Second year.

Students may also submit a coherent pattern of courses in TSE Studies for a B.A. or B.A.(Honours) in Directed Interdisciplinary Studies, in accordance with the procedures described for this degree in the Calendar, p. 237. Assistance in planning such a pattern is available from members of the TSE Committee.

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

Technology, Society, Environment 59.301 ★

Technology-Society Interactions

Ethical issues in introducing technology; historical review of technology and human development; effects on society of medical and communications technologies; automation and its effects on society, especially work; impact of technology on international affairs, especially through multinational enterprises. Guest lectures.

Precludes additional credit for Technology, Society, Environment 59.300 and 59.350 ★.

Prerequisites: At least Second-year standing.

Lectures and workshops three hours per week.

Technology, Society, Environment 59.302 ★

Energy and Sustainability

History of energy use by humans; utilization of renewable energy sources; energy and agriculture; energy and mineral resources; options for electricity generation; nuclear energy; risks of accidents in large systems, e.g. nuclear plants, hydro dams. Guest lectures.

Prerequisites: At least Second-year standing.

Lectures and workshops three hours per week.

Technology, Society, Environment 59.350 ★

Interactions in Industrial Society

Ethical issues involving technology; effects on society of automation, medical and communications technologies; technology and international affairs; energy use by humans; renewable energy sources; energy in agriculture and mineral extraction; electricity generation; nuclear energy; accidents in large systems, e.g. nuclear plants and hydro dams. Guest lecturers. Lectures in common with 59.301 ★ and 59.302 ★.

Precludes additional credit for Technology, Society, Environment 59.301 ★, and 59.300.

Prerequisites: At least Second-year standing.

Lectures three hours per week for both terms.

Technology, Society, Environment 59.401 ★

Technology and Society: Assessment

Examines the complex practice of evaluating technology's impact on society and the environment; risk analysis; cost-benefit analysis; technology regulation; retrospective project assessment; necessary aspects of assessment and assessment examples. Guest lecturers.

Prerequisite: Third-year standing or equivalent.
Lectures and workshops three hours a week.

Technology, Society, Environment 59.402 ★

Technology and Society: Forecasting

Methods used for forecasting technological and social changes; factors involved in such change. Guest lecturers.

Prerequisite: Third-year standing or equivalent.

Lectures and workshops three hours a week.

Technology, Society, Environment 59.403 ★

Technology and Society: Innovation

Technological and social innovation, especially in Canada: historical examples; the relation of innovation to economic development; analysis of the steps involved; effect on employment; impediments and incentives. Guest lecturers.

Prerequisite: Third-year standing or equivalent.

Lectures and seminars three hours a week.

Technology, Society, Environment 59.405 ★

Information Technology and Society

Investigation of the human and social impacts of electronic information and communication on our working, educational, and personal lives from various disciplinary perspectives; problem issues and competing values in the creation, manipulation, dissemination, and control of information are identified; resolution initiatives encouraged. Guest lecturers.

Prerequisite: Third-year standing or equivalent.

Lectures and seminars three hours a week.

Technology, Society, Environment 59.406 ★

Technology and Society: Work

Explores the relationship between technology, employment and the individual; work organizations; employment restructuring; rural/urban split; the impact of information technologies; demographic impacts and globalization; Canadian issues and public policy explored. Guest lecturers.

Prerequisite: Third-year standing or equivalent.

Lectures and workshops three hours a week.

Technology, Society, Environment 59.407 ★

Product Life Cycle Analysis

Life cycle analysis of products and processes, from resource extraction through design and use to waste management or recycling; social and environmental implications of product design and use; how we value material objects and the environment; consumerism; evolution of design. Guest lectures.

Prerequisite: Third-year standing or equivalent.

Lectures and workshops three hours a week.

Other Related Courses

Other courses related to the TSE area offered by various departments and schools within the University are listed for the convenience of students. Detailed course descriptions are given under the appropriate faculty or department. Please note that all prerequisite conditions prescribed for these courses must be met.

Architecture

76.105 ★, 76.302 ★, 76.318 ★, 76.319 ★, 76.423 ★, 76.424 ★, 77.101 ★, 77.135 ★, 77.300 ★, 78.340 ★, 78.350 ★

Biology

61.192 ★, 61.216 ★, 61.391 ★, 61.331 ★, 61.430 ★, 61.431 ★

Chemistry

65.100, 65.103 ★, 65.280 ★, 65.370 ★, 65.380 ★, 65.480 ★

Classics

13.235

Earth Sciences

67.105, 67.238 ★

Economics

43.100, 43.363 ★, 43.385 ★, 43.386 ★

Engineering

82.433 ★, 82.334 ★, 82.440 ★, 82.495 ★

English Language and Literature

18.207

Film Studies

19.333

Geography

45.102 ★, 45.211 ★, 45.220 ★, 45.230 ★, 45.231 ★, 45.320 ★, 45.329 ★, 45.330 ★, 45.336 ★, 45.351 ★, 45.404 ★, 45.426 ★, 45.430 ★, 45.433 ★, 45.434 ★, 45.445 ★

History

24.221, 24.234, 24.254, 24.329 ★, 24.421

Journalism

28.352 ★

Law

51.205, 51.323 ★, 51.325 ★, 51.352 ★, 51.358 ★, 51.380 ★, 51.493 ★, 51.494C ★

Mass Communication

27.305 ★, 27.342 ★, 27.343 ★, 27.410 ★, 27.450 ★, 27.451 ★

Philosophy

32.184 ★, 32.284 ★, 32.332 ★, 32.351

Physics

75.101 ★, 75.102 ★, 75.291 ★

Political Science

47.306 ★, 47.319 ★, 47.341 ★, 47.342 ★, 47.346 ★, 47.367 ★, 47.402 ★, 47.403 ★, 47.508 ★

Psychology

49.101 ★, 49.102 ★, 49.210 ★, 49.220 ★, 49.270 ★, 49.311 ★, 49.313 ★, 49.345 ★, 49.372 ★, 49.405 ★

Science

60.101 ★, 60.102 ★, 60.201 ★, 60.202 ★

Sociology and Anthropology

54.275 ★, 53.251 ★, 56.253 ★, 53.254 ★, 53.260 ★, 54.333 ★, 54.335 ★, 53.339 ★, 53.346 ★, 53.351 ★, 56.360, 53.424 ★, 53.440 ★, 53.380, 53.451 ★

Women's Studies (Arts and Social Sciences)

A812 Loeb Building
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Academic Administration

Director, Katherine Arnup

Teaching Staff

Joint Chair in Women's Studies (Carleton University and University of Ottawa), To be announced

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Katherine Arnup, B.A. (Toronto), B.Ed., M.Ed. (OISE), Ph.D. (Toronto) • **Fran Klodawsky**, B.A. (Toronto), M.A. (Ohio State), Ph.D. (Queen's) (Geography/Women's Studies)

Assistant Professor

Susan Whitney, B.A. (Princeton), M.A. (Brown), Ph.D. (Rutgers) (History/Women's Studies)

Adjunct Professor

Helen Levine (Women's Studies/Social Work)

Adjunct Research Professors

Nancy Adamson, (University Secretary) • **Heather Menzies** (Canadian Studies/Women's Studies) • **K.A. Scott**

General Information

In September 1987, Carleton established the Institute of Women's Studies, which was renamed the Pauline Jewett Institute of Women's Studies in September 1993, to honour the distinguished scholar and social activist Pauline Jewett (1922-1992), Chancellor of Carleton University from 1990 to 1992.

The Pauline Jewett Institute continues to expand on the work of its predecessor, the Interfaculty Committee on Women's Studies, established in 1975. The Institute fosters research and study from a feminist perspective and seeks to promote an awareness on the part of all disciplines of the need to include a fuller treatment of women's experience. Joining in this venture is the Joint Chair in Women's Studies, held jointly at Carleton and the University of Ottawa, and housed at Carleton in the Pauline Jewett Institute.

Carleton was one of the first universities in Canada to offer courses on women, beginning with a course on women's history offered first in 1971-72. Since then, courses and programs have developed in several academic units throughout the university. The Institute of Women's Studies currently offers a B.S. program in Women's Studies, and a Combined B.A. (Honours) program in Women's Studies and another arts or social science discipline. The Combined Honours program requires a deeper study of the methodological and theoretical implications of Women's Studies. The B.A. program is intended to give students a general overview of the field of Women's Studies. Students pursuing a B.A. in Women's Studies must complete a Minor in another academic unit or discipline. Both programs offer interdisciplinary perspectives while also requiring students to develop a disciplinary base for their studies.

Students enrolled in a B.A. or B.A. (Honours) program in another discipline may also elect to complete a Minor in Women's Studies.

Graduation Requirements

In order to graduate, students must fulfill all University graduation regulations (see p. 48), all Faculty regulations including those relating to First-Year Seminars and Breadth requirements (see p. 63), in addition to all Institute regulations and requirements as set out below.

Combined B.A. (Honours) Program

Students planning a Combined B.A. (Honours) program are advised to consult with the Director of the Institute of Women's Studies. The requirements for a Combined B.A. (Honours) in Women's Studies are a minimum of 7.0 credits as follows:

1. Women's Studies 09.188 or First-Year Seminar 01.142 or 01.143
2. 09.280 ★ and 09.281 ★
3. 09.388
4. Electives: 3.0 credits from Anthropology 54.248 ★, 54.249 ★, Comparative Literary Studies 17.302, English 18.292, History 24.254, 24.346 ★, 24.354, 24.363 ★, 24.375 ★, Law 51.301 ★, Linguistics and Applied Language Studies 29.273 ★, Mass Communication 27.355 ★, Music 30.332 ★, 30.433 ★, Philosophy 32.236 ★, 32.237 ★, Political Science 47.350 ★, 47.351 ★, 47.352 ★, Psychology 49.363 ★, Religion 34.203 ★, 34.325 ★, Sociology 53.247
5. 400-level elective. 1.0 additional credit from: Women's Studies 09.490 ★, 09.491 ★, 09.492 ★, 09.498, Business 42.462 ★, History 24.452, 24.454, 24.459, Journalism 28.437 ★, Law 51.401 ★, Philosophy 32.423 ★, 32.424 ★, Political Science 47.450 ★, Sociology 53.407 ★, Sociology/Antropology 56.479 ★

Other courses may be substituted for the credits specified above in items 4 and 5 (e.g. Law 51.384, Art History 11.400 ★) when material on gender and/or women's experience is central to the course. Such substitutions must be individually approved by the Institute of Women's Studies.

B.A. Program

Students planning to pursue a B.A. in Women's Studies are advised to consult with the Director of the Pauline Jewett Institute of Women's Studies.

The requirements for a B.A. program in Women's Studies are a minimum of 6.0 credits as follows:

1. Women's Studies 09.188 or First-Year Seminar 01.142 or 01.143
2. 09.280 ★ and 09.281 ★
3. 09.388

4. Electives: 3.0 credits selected from the following courses, at least 1.0 of which must be at the third year level. Anthropology 54.248★, 54.249★; Art History 11.361★, 11.460★; Business 42.462; Comparative Literary Studies 17.302; English 18.292; Film Studies 19.331★; History 24.254, 24.346★, 24.354, 24.363★, 24.375★, 24.377★; Law 51.301★; Linguistics and Applied Language Studies 29.273★; Mass Communications 27.355★; Music 30.332★, 30.433★; Philosophy 32.236★, 32.237★; Political Science 47.350★, 47.351★, 47.352★; Psychology 49.363★, Religion 34.203★, 34.325★; Sociology 53.321★ and Sociology/Anthropology 56.246★, 56.245★.

Other courses may be substituted for the credits specified above in item 4 (e.g. Law 51.384) when material on gender and/or women's experience is central to the course. Such substitutions must be individually approved by the Institute of Women's Studies.

Students pursuing a B.A. in Women's Studies must complete a Minor in another academic unit or discipline. For assistance, students are strongly urged to consult with the Director of the Pauline Jewett Institute of Women's Studies.

Note: Courses used to satisfy the elective requirements of the Major (item 4 above) cannot also be credited towards the Minor.

Minor in Women's Studies

Students enrolled in a B.A. (Honours) or B.A. program in another discipline may also elect to complete a Minor in Women's Studies. Students wishing to pursue a minor in Women's Studies are required to complete 4.0 credits, with a GPA of 4.0 or better, selected from the following list.

1. Women's Studies 09.188 or First-Year Seminar 01.142 or 01.143
2. 09.280★ and 09.281★

3. 2.0 credits selected from the following courses, at least 1.0 must be at the 300-level. Women's Studies 09.388, Anthropology 54.248★, 54.249★, Comparative Literary Studies 17.302, English 18.292, Film Studies 19.331★, History 24.254, 24.346★, 24.354, 24.363★, 24.375★, Law 51.301★, Linguistics and Applied Language Studies 29.273★, Mass Communications 27.355★, Music 30.332★, 30.433★, Philosophy 32.236★, 32.237★, Political Science 47.350★, 47.351★, 47.352★, Psychology 49.363★, Religion 34.203★, 34.325★, Sociology 53.247.

Note: Other courses may be substituted for the credits specified above when material on gender and/or women is central to the course. Such substitutions must be individually approved by the Institute.

Requirement for Breadth, for students in B.A. or B.A.(Honours) degrees

Category for Breadth	Courses in this unit
The temporal dimension of human societies, analyzing times before the present era or societies other than our own	
The artifacts of the imagination in literature and/or other forms, or that addresses the life of the imagination and culture.	01.143
The understanding of social, technological and/or natural processes and the ways in which that understanding is obtained in science and social science.	All other courses in Women's Studies not listed in any other category
Matters of human values, ethics and social responsibilities	09.280

Courses

Not all of the following courses are offered in a given year. For an up-to-date statement of course offerings for 1999-2000, please consult the *Registration Instructions and Class Schedule* booklet published in the summer.

First-Year Seminar in Women's Studies 01.142

Issues in Women's Studies

Emphasis on the development of writing, research and analytical skills though the intensive examination of selected topics in women's studies (e.g. Motherhood, sexuality, health, technology, law, politics). Specific themes will vary from year to year. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

First-Year Seminar in Women's Studies 01.143

Women and the Arts

Feminist research across a range of arts disciplines (including music, theatre, visual arts and film). The importance of feminist debates and theoretical issues in understanding women's involvement in the arts. Topics include gender and sexuality, feminine aesthetics, representation, identity and difference. Limited enrolment.

Prerequisite: Normally restricted to students entering the First year of a B.A. program.

Seminars three hours a week.

Women's Studies 09.188

Introduction to Women's Studies

Women in contemporary society: gender differentiation, women's relationship to such issues as politics, religion, work, health, the law, and the arts; and the intellectual, historical and social origins of feminism.

Precludes additional credit for Women's Studies 09.288.

Lectures and discussion three hours a week.

Women's Studies 09.280★

Gender and Diversity

Exploration of how definitions of gender are associated with other social categories, and how some, such as race, ethnicity, class, sexual orientation and ability/disability, affect women's experiences as individuals and as members of groups.

Prerequisite: Women's Studies 09.188 (formerly 09.288) or 01.142 or 01.143 or Interdisciplinary Studies 03.101.

Lectures and discussion three hours a week.

Women's Studies 09.281★

Topics in Women's Studies

Interdisciplinary analysis of topics in women's studies focusing on the relationship between women's public activism and feminist thought, and between cultural perceptions of women and women's experiences. The topic will be announced by July 1.

Prerequisite: Women's Studies 09.188 (formerly 09.288) or 01.142 or 01.143 Lectures and discussion three hours a week.

Women's Studies 09.388

Theory and Methods From a Feminist Perspective

Exploration of emerging feminist literatures in the humanities and in the social, natural and applied sciences. Feminist critiques of prevailing approaches to knowledge and feminist contributions to the development of theory and method are considered.

Prerequisites: Third-year standing, and Women's Studies 09.188 (formerly 09.288) or 01.142 or 01.143

Lectures and discussion three hours a week.

Women's Studies 09.490★

Independent Study

Reading or research course supervised by a faculty member. Written proposal approved by the supervisor must be submitted before

last day of course changes. Normally, only 0.5 credit of independent study may be counted in the program.

Prerequisites: Third-year standing or above and permission of the Institute.

Women's Studies 09.491 ★

Selected Topics in Women's Studies I

Prerequisite: Permission of the Institute of Women's Studies.

Seminar three hours a week.

Women's Studies 09.492 ★

Selected Topics in Women's Studies II

Prerequisite: Permission of the Institute of Women's Studies.

Seminar three hours a week.

Women's Studies 09.498

Honours Research Essay

Students in the Combined Honours Program in Women's Studies and another discipline may write an honours research essay in Women's Studies. The subject for research is settled in conjunction with the Institute and an appropriate supervisor.

Prerequisites: Fourth-year standing in Women's Studies and 09.388.

Courses with Substantial Material on Gender or Women's Experience Offered Within the Faculty of Arts and Social Sciences, the Faculty of Public Affairs and Management and the Faculty of Graduate Studies and Research

The following course offerings are listed here for the convenience of students. Detailed course descriptions are given under the appropriate faculty, or interdisciplinary listing.

Note: Special Topics courses and other courses offered by units throughout the university may in any given year contain substantial material on Gender and/or Women's Experience. Recent examples include offerings in Art History, Geography, History, Journalism and Sociology.

Faculty of Arts and Social Sciences

Art History

11.514 ★

Canadian Studies

12.520

Comparative Literary Studies

17.302

English Language and Literature

18.292

Geography

45.544

History

24.254, 24.346 ★, 24.354, 24.363 ★, 24.375 ★, 24.452, 24.454, 24.459, 24.559

Linguistics and Applied Language Studies

29.273 ★

Music

30.332 ★, 30.433 ★, 30.505 ★

Philosophy

32.236 ★, 32.237 ★

Psychology

49.363 ★, 49.580 ★

Religion

34.203 ★, 34.325 ★

Sociology-Anthropology

53.247, 53.482 ★, 53.537 ★, 53.538 ★ / 54.538 ★, 53.548 ★ / 54.548 ★, 54.550 ★, 53.568 ★, 54.248 ★, 54.249 ★, 54.519 ★, 56.241, 56.459 ★

Faculty of Public Affairs and Management

Business

42.462

Law

51.301 ★, 51.384, 51.401 ★, 51.402 ★, 51.502 ★, 51.532 ★

Mass Communication

27.355 ★

Political Science

47.350 ★, 47.351 ★, 47.352, 47.450 ★

School of Social Work

52.506 ★, 52.516 ★, 52.528 ★

General Information

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- Officers of the University
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Awards and Financial Assistance

Awards for Academic Excellence

Medals

The Governor-General's Medal-Bachelor Degree Program

Awarded annually to the graduating student with the highest academic standing in a Bachelor degree program. Donor: His Excellency the Governor General of Canada. Established 1952.

The Chancellor's Medal

Awarded annually in the name of the Chancellor of the University to a graduating student of outstanding academic achievement. Established 1962.

The President's Medal

Awarded annually in the name of the President of the University to the student with the highest standing in a B.A. program of studies. Established 1968; revised 1980.

University Medals

Awarded annually, when merited, to the graduating students standing highest in Arts, Social Sciences, Science, Engineering, Architecture, Commerce, Computer Science, Journalism, Industrial Design, interfaculty studies, Music, Public Administration and Social Work. Established 1949.

Senate Medals

Awarded, when merited, to graduating students of outstanding academic achievement. Established 1952.

Lieutenant-Governor's Medal in Architecture

Awarded annually, when merited, to the student standing at the head of the graduating class in Architecture. Established 1979.

Undergraduate Entrance and In-Course Scholarships and Awards

Carleton University awards scholarships tenable at the University, in the Fall/Winter session of the year of offer, to entrance and in-course full-time undergraduate students who have demonstrated a high potential for university studies. The intention of the scholarship policy is to recognize, attract and provide incentives for excellence. The total value of the scholarship or scholarships awarded is determined by the student's most recent academic standing.

The following entrance scholarships will be offered in 1999-2000:

☒ Ten Chancellor's scholarships with a total possible value of \$20,000 over four years, (\$5,000 a year). These scholarships may be continued each year of full-time enrolment, provided the student maintains a GPA of 10.0 or better. These scholarships require an application, which must be completed and returned to the Awards Office by May 15. Priority will be given to academic performance, but the committee will also consider the applicant's other interests and activities during secondary school.

Our other entrance scholarships are automatically offered to students who have been admitted to Carleton University with a high school average of 80 percent or better. Applications are not required for these awards. The scholarships range in value from \$500 per year to \$3,500. Most scholarships are renewable for a total of four years and have an academic requirements of 10.0 GPA or better for renewal. If a renewable scholarship is lost in one year, it can be regained in future years.

* Fifteen awards valued at \$500 for the entrance year only, to be given to the top students entering Carleton from secondary schools in the Regional Municipality of Ottawa-Carleton. This award will be in addition to any other the student may receive from Carleton.

All in-course students and all graduating students who meet the academic requirements for the awarding of University in-course scholarships will be named to the Deans' Honour List for every year in which they qualify.

University in-course scholarships (based on full- or part-time study) will be awarded on the following conditions:

1. The student must be enrolled in a degree program at the time of selection;
2. The student will not be offered a scholarship beyond the Fourth year of study;
3. A GPA of 10.0 or better is required;
4. The grade points of all credits taken in the period considered for the scholarship will be used to calculate the GPA;
5. No F, or Abs will be acceptable during the period considered for the scholarship;
6. No grades achieved through a grade-raising examination will be considered;
7. Each summer, the Selection Subcommittee will determine the value of the scholarships to be awarded for each GPA; and
8. Students in the Co-operative Education stream and the Industrial Experience program will not draw upon scholarship funds for a work period. On returning to full-time studies they will come under scholarship provisions.

Full-time Students:

1. The definition of a full-time student is a student who registers in a minimum of 4.0 credits during the Fall/Winter Session.
2. Scholarships will be based on all credits taken in the 12-month period May to April.
3. In order to hold the scholarship, the student must be returning to Carleton as a full-time undergraduate student.

Part-time Students:

1. The definition of a part-time student is a student who registers in fewer than 4.0 credits during the Fall/Winter Session.
2. Candidates will be considered for scholarships based on the average of all credits (minimum of four) taken in the past 24 month period (May-April). However, if the candidate was awarded a scholarship the previous spring, a minimum of four new credits must be considered for the new scholarship; the same credit may not be used twice for scholarship consideration.
3. The student must be continuing at Carleton in his or her undergraduate degree program.

Note: Since the income from funds may vary from year to year, the values shown for scholarships, awards and bursaries may change.

Scholarships and Awards by Faculty

Scholarships and awards of varying amounts, which are of interest to students in specific programs, are listed below:

Faculty of Arts and Social Sciences

Arts

A. Andras Memorial Grant
Award of the Embassy of Austria (German)
Jack Barwick and Douglas Duncan Memorial Scholarship in Art History

Jack Barwick and Douglas Duncan Memorial Scholarship in Music
 Karl Bernhardt Scholarship in Psychology
 Landen Dominic Burnett Memorial Award (Art History)
 Elinor Burwell Scholarship in Psychology
 The Colonel John By Award for History
 Carleton Beaverbrook Awards for Freedom of the Press (History)
 CHEZ-FM Research Award in Sociology and Anthropology
 Coulson Memorial Scholarship (Classics)
 Bertha F. Davis Award in Religion
 Department of French Awards
 Awards of the Embassy of France (French)
 Awards of the Embassy of the Federal Republic of Germany (German)
 Fitzroy Township Historical Society Scholarship
 Richard Glover Scholarship (History)
 Louis and Miriam Goldstein Book Award in Judaic Studies (Religion)
 Rosemarie Hoey Award in English
 Sara Helen Parry Hughes Memorial Award (English)
 Award of the High Commission of India (Religion)
 Allama Mohammad Iqbal Award (Religion)
 Award of the Embassy of Italy (Italian)
 George Johnston Poetry Award (English)
 Eldon Kaye Memorial Scholarship (French)
 Marston LaFrance Memorial Award in English
 David Carton MacDonald Memorial Award (English)
 Macdonald Club Awards in Music
 R.L. McDougall Award in English
 Music Award
 Jayashree A. Nagpur Memorial Award (English)
 Helen Nininger Scholarship in Music
 Bettina Oppenheimer Memorial Scholarship in Music
 Ordine Italo-Canadese Scholarship (Italian)
 Robert E. Osborne Award (Religion)
 Ottawa Film Society Scholarship for Film Studies
 Ottawa Women's Canadian Club Scholarship (Canadian Studies)
 Department of Russian Undergraduate Award
 Award of the Embassy of Spain (Spanish)
 Bette Spooner Award in Classics
 Randell Stanton Memorial Book Prize (English)
 John and Carol Strong Book Prize (History)
 Barbara Sudall Book Prize (English)
 Award of the Ambassador of Switzerland to Canada (French, German, Italian)
 Imam Tawfiq Shaheen Memorial Scholarship
 Michael Thompson Scholarship in English
 Underhill Prize (History)
 United Empire Loyalists Scholarship in Canadian Studies
 R.A. Wendt Book Prize (Psychology)
 Wilgar Memorial Award in English
 Gordon J. Wood Scholarships in English
 Susan Joan Wood Memorial Scholarship (English)
 Hume Wrong Scholarship (History)

Faculty of Engineering and Design

Architecture

Michael Russell Coote Memorial Award
 The Education Foundation of the Federation of Chinese Canadian Professionals of Ontario Entrance Scholarship
 The Education Foundation of the Federation of Chinese Canadian Professionals of Ontario Scholarship
 Ontario Association of Architects Awards
 Page and Steele School of Architecture Scholarship
 Jacques and Hélène Sabourin Memorial Scholarship
 Nicholas C. Scolozzi Scholarship in Architecture
 Randell Stanton Memorial Book Prize

Engineering

Adjeleian Allen Rubeli Prize
 AFCEA Scholarship
 Rajesh Ahluwalia Memorial Scholarship
 American Society for Metals Award in Engineering
 Building Envelope Council, Ottawa Region, Award
 Joseph and Yvonne Bulger Scholarship in Engineering
 Chipworks Award
 Consulting Engineers of Ontario Scholarship
 CSME Gold Medal
 W.R. Davis Engineering Scholarship
 Engineering Institute of Canada Award
 Golder Associates Award
 Krishnakumar Gopalan Memorial Scholarship
 Andrew S. Haydon Scholarship
 Kipling Award
 Roderick C. McDonald Memorial Scholarship in Engineering
 McNaughton Scholarship
 Luigi Mion Scholarship in Engineering
 National Capital Harvard Business School Alumni Club Book Prize
 Ontario Hydro Engineering Award
 Ontario Professional Engineers Foundation for Education Scholarship
 Dr. C. Stewart Parsons Scholarship in Engineering
 The Robert Pickard Scholarship in Environmental Engineering
 Pratt & Whitney Canada (Undergraduate) Scholarships
 James H. Rattray Memorial Scholarship
 Riordon Scholarship
 Rolls-Royce Scholarship
 Professor H.I.H. Saravanamotto Scholarship in Mechanical and Aerospace Engineering
 Eric Sigurdson Award
 Stentor Scholarships in Communications Engineering
 Vered Foundation Scholarships

Industrial Design

Michael Elmarson Award
 George A. Lynn Memorial Scholarship
 Barrington Nevitt Memorial Award
 Purvins Memorial Award

Faculty of Science

Science

Motoshi Asano Memorial Scholarship in Chemistry
 Paul R. Beesack Memorial Scholarship in Mathematics
 Berke Scholarship in Chemistry
 Dr. M. Ralph Berke Award in Chemistry
 Director's Award in Biochemistry
 Charles Anthony Blundell Betts Memorial Scholarship in Physics
 J.P. Bickell Foundation Scholarships (Geology)
 The Canadian Society for Chemistry Medal
 Canadian Society of Petroleum Geologists Undergraduate Student Award
 Society of Chemical Industry Award
 W.H. Collins Memorial Scholarship
 Catherine Daumery Memorial Award for Botanical Collection
 Director's Award in Environmental Science
 Josef Dlouhy Memorial Scholarship in Chemistry
 The Al Donaldson Award in Precambrian Geology
 Gary S. Duck Scholarship in Science
 Dr. Reginald T. Elworthy Award in Chemistry
 E. Alison Flood Award in Physical Chemistry
 GAC-MAC Undergraduate Scholarship in Earth Sciences
 Peter Gerard Harris Memorial Award (Mass Communication)
 Ian H. Griffith Memorial Scholarships
 Simon Guest Memorial Book Prize (Geology)

Awards and Financial Assistance

Trevor A. Harwood Memorial Award
E.P. (Ted) Hincks Memorial Scholarship in Physics
E.P. Hincks Award of the Institute of Particle Physics
J.M. Holmes Entrance Scholarship in Chemistry
Professor James M. Holmes Scholarship in Chemistry
Janet M. Holmes Memorial Scholarship (Chemistry)
Dr. Harry Katznelson Memorial Scholarship (Biology)
School of Mathematics and Statistics Entrance Award
Betty Nesbitt Memorial Award in Biology
H.H.J. Nesbitt Scholarship in Biology
F.K. North Award in Geology
Dr. Iain Ogle Memorial Scholarship (Geology)
Ottawa Section of the Petroleum Society of CIM Annual Award
R.L. Rosenberg Memorial Scholarship in Mathematics
Richard J. Semple Memorial Award in Mathematics
L.N. Wadlin Scholarship in Mathematics
Elizabeth White Memorial Award for Zoological Collection
Donald R. Wiles Scholarship in Chemistry
The Donald R. Wiles Scholarship in Environmental Science
Morley E. Wilson Scholarship (Geology)

Computer Science

CIPS Ottawa Section Scholarship
Jamie Corbet Memorial Award
Andrew S. Haydon Scholarship
National Capital Harvard Business School Alumni Club Book Prize
John R. Pugh Scholarship
Derek Rymerson Scholarship
David A. Thomas Scholarship in Computer Science
Goldie Wilkinson Scholarship

Faculty of Public Affairs and Management

Abbott Memorial Award in Law
Bay Street Challenge Award for Excellence in Information Systems
Bay Street Challenge Award for Excellence in International Business
Bay Street Challenge Scholarship for Excellence in Securities Finance
The Honourable Walter Baker Memorial Scholarship in Political Science
Bank of Nova Scotia, Carleton University Branch Award in Commercial Law
Professor T.N. Brewis Scholarship in Applied Economics
Claude Brunelle Memorial Scholarship (Central/East European and Russian-Area Studies)
CCH Canadian Limited Award in Taxation
Carswell Company Book Award in Public Law
Victor S. Castledine Scholarship (Economics or Business)
CHEZ-FM Research Award(s) in Mass Communication
Communications Law Prize
Scholarship in Comparative Economics
Economics Scholarship
Randall Geehan Memorial Scholarship in Quantitative Economics
Irwin Gillespie Award in Economics
Mr. and Mrs. Louis L. Goldstein Book Award in Law
Peter Gerard Harris Memorial Award (Mass Communication)
KPMG Scholarship
R.A. MacKay Award in Political Science
Betty Nesbitt Memorial Award in Biology
The Osgoode Society Legal History Book Prize
Oxford University Press Award in Law
Prince Memorial Achievement Award (Economics)
Rogers Communications Award in Mass Communication
R.L. Rosenberg Memorial Scholarship in Mathematics
Celia Ruygrok Memorial Scholarship (Criminology and Criminal Justice)
Richard J. Semple Memorial Award in Mathematics
Vered Foundation Scholarship (Political Science)
Jessie and Wreford Watson Award in Geography

Hume Wrong Scholarship (Political Science)
YTV Canada Inc. Youth & Television Award (Mass Communication)

Business

Bay Street Challenge Award for Excellence in Information Systems
Bay Street Challenge Award for Excellence in International Business
Bay Street Challenge Scholarship for Excellence in Securities Finance
Victor S. Castledine Scholarship
Certified General Accountants Association of Ontario Award for Excellence
Deloitte & Touche Scholarships
Ernst & Young Award
Lil Fallis Scholarship
W.P. MacDonald Memorial Scholarship in Accounting
D.F. McKechnie Award in Accounting
Mr. Sub Scholarship
National Capital Harvard Business School Alumni Club Book Prize
James Nolan Memorial Award
Ottawa Human Resources Professional Association Award
Stewart G. Paul Memorial Award
Charles Pinhey Award
Samuel Sair Prize in Business Ethics
Lawrence Segal Memorial Fund
Women's Business Network Association of Ottawa Scholarship

Journalism

John E. Bird Memorial Scholarship
Elissa Gail Bonder Scholarship in Journalism
Julie Bycraft Memorial Scholarship
The Canadian Corporate News Scholarship in Journalism
The Anne Donaldson Memorial Scholarship
Wilfrid Eggleston Award in Journalism
Bob Farquharson Memorial Award in Journalism
The Education Foundation of the Federation of Chinese Canadian Professionals of Ontario Scholarship
Blair Fraser Memorial Award for Journalism Graduates
Goldblatt Scholarship in Journalism
Marisa Ann Golini Memorial Scholarship in Journalism
Margaret Graham Award
Mitch Jacobson Memorial Award in Photojournalism
Judith Johansen Memorial Award
Journalism Writing Style Book Award
Charles Lazarus Scholarship
Jeannette Matthey Memorial Scholarship
National Capital Harvard Business School Alumni Club Book Prize
Marjorie Nichols Memorial Award
Ottawa Citizen Scholarship in Journalism
Peter Reilly Scholarship
Rogers Communications Award in Television Journalism
Herman and Zelda Roodman Award in Journalism
E. Norman Smith Memorial Award
Kenneth F. Smith Memorial Award in Journalism
Richard R. Snell Memorial Award in Journalism
Thomson Award for Reporting
Vistas Scholarship
Kenneth R. Wilson Memorial Award for Journalism Graduates
Phyllis Wilson Award in Journalism

Undergraduate In-Course Scholarships for Part-Time Students

Undergraduate University Scholarships
University Women's Club of Ottawa Scholarships

Undergraduate Scholarships and Awards

Abbott Memorial Award in Law

Value \$200. Awarded annually for proficiency in Law courses taken at Carleton University to a student planning to enter law school. Donor: Dr. Frank Abbott. Established in 1997 in memory of Mrs. George S. Abbott and Professor Richard D. Abbott, founding Chair of the Department of Law.

Adjeleian Allen Rubeli Prize

Awarded annually, on the recommendation of the Chair of the Department of Civil and Environmental Engineering, to the students submitting the best and second best Fourth-year engineering project. Donor: Adjeleian Allen Rubeli & Associates. Endowed 1989.

AFCEA Scholarship

Value \$1000. Awarded annually, on the recommendation of the Dean of Engineering and Design or the Director of the School of Computer Science. This scholarship is given alternately to a student in the Electrical or Computer Systems program and the Computer Science program. The recipient must be an outstanding student who is a Canadian citizen proceeding from Third to Fourth year of the program. Donor: Armed Forces Communications and Electronics Association (AFCEA) Ottawa Chapter. Established 1990. Revised 1993.

Rajesh Ahluwalia Memorial Scholarship

Awarded annually, on the recommendation of the Dean of Engineering and Design, to a deserving student proceeding from Third to Fourth year of an engineering program. Donors: Family and friends of Rajesh Ahluwalia, M. Engineering, Carleton 1975. Established 1993.

American Society for Metals Award in Engineering

Value \$100. Awarded annually to an outstanding student with an interest in materials engineering. Donor: Ottawa Valley Chapter, American Society for Metals. Established 1951. Revised 1984.

A. Andras Memorial Grant

To support the cost of a research project or paper undertaken by an undergraduate or graduate student attending Carleton University. This grant is awarded in alternate years for a research project in one of the following areas: (a) Jewish studies; (b) trade union history or the democratic socialist movement in Canada. Endowed 1972 in memory of the late Mr. A. Andras, a member of Carleton's Board of Governors. Revised 1978.

Motoshi Asano Memorial Scholarship in Chemistry

Awarded annually on the recommendation of the Department of Chemistry to a student in a Chemistry program. Preference shall be given to a full-time student in physical spectroscopy. Donated by the Asano family of Kobe, Japan, in memory of their son, Motoshi Asano, who received his Ph.D. in physical chemistry at Carleton in 1983, and who tragically lost his life in a mountain climbing accident two months later. Endowed 1984.

Medal of the Association of Professional Engineers (Ontario)

Awarded annually, when merited, to the graduating student standing highest in Engineering. Established 1961.

Award of the Embassy of Austria

For excellence in the study of German, a book award is offered annually by the Austrian Embassy in Canada. Established 1960.

The Honourable Walter Baker Memorial Scholarship in Political Science

Awarded annually on the recommendation of the Department of Political Science to one or more students finishing the Third year of an Honours program. The selection will be made on the basis of high academic standing, with consideration given to demonstrated political leadership or involvement in politics. This scholarship is given in memory of the Honourable Walter Baker, P.C., Q.C., M.P.,

B.A., a distinguished graduate of Carleton University. Endowed in 1984 by friends of the Honourable Walter Baker.

Frederick William Baldwin Scholarship

Awarded annually to outstanding students entering or proceeding from one year of program to another at Carleton University. Donor: Estate of Frederick William Baldwin. Endowed 1983.

Bank of Nova Scotia, Carleton University Branch, Award in Commercial Law

Value \$100. Awarded annually to a student with high standing in courses in the Commercial Law field. Donor: the Bank of Nova Scotia, Carleton University Branch. Established 1980.

F. Luella Barrigar Scholarships

Awarded annually to students entering Carleton University or proceeding from one year of program to another. Some preference shall be given to students with an interest in music. These scholarships are provided through the bequest of the late Miss F. Luella Barrigar, a teacher of music at the Ottawa Teachers' College. Donor: The late F. Luella Barrigar. Endowed 1981.

Jack Barwick and Douglas Duncan Memorial Scholarship for Art History

Awarded annually to a student or students in the Art History program. The Director of the School for Studies in Art and Culture and faculty members of the Art History program are to decide each year on the most appropriate disbursement of the award. Donor: Mrs. J.P. Barwick. Endowed 1972. Revised 1992.

Jack Barwick and Douglas Duncan Memorial Scholarship for Music

Awarded annually to a student or students in the Music program. The Director of the School for Studies in Art and Culture and faculty members of the Music program are to decide each year on the most appropriate disbursement of the award. Donor: Mrs. J.P. Barwick. Endowed 1972. Revised 1992.

Bay Street Challenge Award for Excellence in Information Systems

Value \$500. Awarded annually, when merited, on the recommendation of the Director of the School of Business, to the student with the highest academic standing who is proceeding from Third to Fourth year of the Bachelor of Commerce program with a Concentration in Information Systems. Established in 1996 by a graduate of the School of Business to encourage competition among students.

Bay Street Challenge Award for Excellence in International Business

Value \$500. Awarded annually, when merited, on the recommendation of the Director of the School of Business, to the student with the highest academic standing who is proceeding from Second to Third year of the Bachelor of International Business or the Bachelor of Commerce program with a Concentration in International Business. Established in 1996 by a graduate of the School of Business to encourage competition among students. Revised 1998.

Bay Street Challenge Scholarship for Excellence in Securities Finance

Two scholarships valued at \$1000 each. Awarded annually, on the recommendation of the Director of the School of Business, to the student who has achieved the highest marks in the course 42.352★ Principles of Investments and the student who has achieved the highest marks in the course 42.452★ Investment Management. Established in 1996 by a graduate of the School of Business to encourage competition among students and to raise awareness of the securities industry as a career option.

Paul R. Beesack Memorial Scholarship in Mathematics

A scholarship and book prize awarded annually to the student, continuing to the Second year of an Honours Program in the Department of Mathematics and Statistics, with the highest combined standing in the required (full-credit) mathematics courses of First year. Endowed in 1986 by the family, friends and academic colleagues of the late Paul R. Beesack, an outstanding analyst, who served this University, his department and his discipline with excellence.

Berke Scholarship in Chemistry

Awarded annually to an outstanding student proceeding to the Second year of an Honours Chemistry program. Donor: Dr. and Mrs. M. Ralph Berke. Endowed 1981.

Dr. M. Ralph Berke Award in Chemistry

The yield of a \$500 fund is awarded each year, if merited, on the recommendation of the Department of Chemistry for a prize to be awarded to an outstanding student majoring in chemistry proceeding from the Second to the Third year of the degree program. Donor: Dr. M. Ralph Berke. Endowed 1956.

Karl Bernhardt Scholarship in Psychology

Awarded annually, on the recommendation of the Chair of the Department of Psychology, to a student entering the Fourth year of the Honours Psychology program who has demonstrated excellence in the area of Personality and/or Developmental Psychology. Endowed in 1992, by family, in memory of Professor Karl S. Bernhardt, a Canadian pioneer in child psychology and former Director of the Institute of Child Study at the University of Toronto.

Charles Anthony Blundell Betts Memorial Scholarship in Physics

Awarded annually, if merited, to a student of high proficiency in Physics, entering or continuing in Physics Honours or in the Major program, in the Second or subsequent years of the degree program. Donors: Mr. and Mrs. Oliver Betts, Birmingham, England, in memory of their son, Charles Anthony Blundell Betts. Endowed 1964.

Dr. Thomas Betz Memorial Award

Value \$1000. Awarded annually, when merited, on the basis of scholarly promise and potential for intellectual leadership. This award is open to undergraduate and graduate students. The recipient will be chosen on the recommendation of a Selection Committee chaired by the Dean of the Faculty of Graduate Studies and Research, from a list of candidates nominated by departments, schools and institutions. Established in 1990 by family, friends and colleagues in memory of Dr. Thomas Betz.

J.P. Bickell Foundation Scholarships

The Trustees of the J.P. Bickell Foundation have established in the Department of Earth Sciences, Faculty of Science, scholarships for students entering the geological profession, of a possible value of \$3,000 each. The scholarships may be awarded on entrance into the Honours Geological sequence at the First-, Second- or Third-year levels at Carleton University. The scholarships are payable over two or three years depending on the entrance level. Donor: J.P. Bickell Foundation, Trustees, National Trust.

John E. Bird Scholarships

Two scholarships are awarded annually to outstanding students who are proceeding from one year of program to another in a Degree program in Journalism. Donor: Estate of Mrs. V. Bird. Endowed 1981.

Director's Award in Biochemistry

Value \$100. Awarded annually to the Fourth-year Biochemistry student performing the most distinguished Honours Research project. Donor: Anonymous. Endowed 1981.

Elissa Gail Bonder Scholarship in Journalism

Awarded in alternate years, on the recommendation of the Director of the School of Journalism and Communication, to an outstanding student entering the First year of the Journalism program from a high school in the Regional Municipality of Ottawa-Carleton. Established in 1995 by Linda and Ted in memory of his daughter Elissa Gail Bonder who graduated posthumously from Lisgar Collegiate Institute in 1991.

Professor T.N. Brewis Scholarship in Applied Economics

Value \$1,000. Awarded annually on the recommendation of the Department of Economics to an undergraduate or graduate student in the department. Preference shall be given to a student who has shown aptitude in the field of applied economics. Professor

Brewis was a distinguished member of the Department of Economics at Carleton University for 25 years and is well known for his contributions in the fields of macroeconomic and regional economic policy. Donor: Professor T.N. Brewis. Endowed 1981.

Claude Brunelle Memorial Scholarship

Awarded annually on the recommendation of the Institute of Central/East European and Russian-Area Studies to the student with the highest standing among those proceeding from the Third to the Fourth year of the undergraduate program. Donors: Family, friends and colleagues of the late Claude Brunelle, a former student of the Institute. Endowed 1985.

Donald William Buchanan Scholarship

Awarded annually for general competition among students entering Carleton University. Donor: The late Donald William Buchanan. Endowed 1967.

Building Envelope Council, Ottawa Region, Award

Value \$250. Awarded annually, on the recommendation of the Chair of the Department of Civil and Environmental Engineering, to a graduating student in an undergraduate or graduate program of study who has demonstrated excellence in the area of building envelopes. Donor: The Building Envelope Council, Ottawa Region (BECOR). Established 1995.

Joseph and Yvonne Bulger Scholarship in Engineering

Two scholarships are awarded annually, on the recommendation of the Dean of Engineering and Design, to students of high proficiency and who are Canadian citizens proceeding from one year to another of the Civil Engineering program. Preference will be given to students who attended a high school in the National Capital Region. Endowed in 1991 by friends of Joseph V. Bulger in honour of his dedication and service to the engineering and construction industry.

Landen Dominic Burnett Memorial Award

Value \$300. Awarded annually to an outstanding student in the Art History program. The recipient will be chosen by the Director of the School for Studies in Art and Culture on the recommendation of faculty members of the Art History program. Donor: The Vered Foundation. Established 1979. Revised 1992.

Dr. John Davis Burton Award

Awarded annually, when merited, to a student in good standing enrolled in a program at Carleton University, University of Ottawa, La Cité Collégiale or Algonquin College who has made a significant contribution toward awareness, equality and integration of persons with disabilities within his/her educational community. The recipient will be chosen on the recommendation of the Assistant Director (Special Needs), Counselling and Student Life Services at Carleton University, assisted by a Selection Committee. Endowed in 1992 by students, family and friends of Dr. John Davis Burton, who was a champion and advocate for persons with disabilities throughout his career as an educator.

Elinor Burwell Scholarship in Psychology

Awarded annually, on the recommendation of the Chair of the Department of Psychology, to a student entering the Fourth year of the Honours Psychology program who has demonstrated interest and excellence in the area of the Psychology of Women and/or the Psychology of Aging. Preference will be given to mature students. Endowed in 1998 by the family and friends in memory of Professor Elinor J. Burwell, a member of the Carleton Department of Psychology 1963-1996.

The Colonel John By Award for History

A prize awarded in alternate years to a student in a Third-year history course who writes the best paper on a topic relating to Canadian history. Preference will be given to papers concerning the National Capital Region. Donor: The Historical Society of Ottawa. Established 1990.

Julie Bycraft Memorial Scholarship

Value \$1000. Awarded on the recommendation of the Director of the School of Journalism and Communication to an outstanding student who is entering the First year of the Bachelor of Journalism program. Established in 1997 by family and friends to honour Julie.

D. Roy Campbell Scholarship

Awarded annually, under the terms of the will of the late D. Roy Campbell, for competition among students entering Carleton University with high standing in the senior matriculation examinations or the equivalent. Donor: The late D. Roy Campbell. Endowed 1962.

Henry Campbell Scholarships

Two scholarships awarded annually to full-time students entering or progressing from one year to the next at Carleton University. Provided from the estate of the late Edna Alice Campbell. Endowed 1978.

The Canadian Corporate News Scholarship in Journalism

Value \$1000. Awarded annually, on the recommendation of the Director of the School of Journalism and Communication, to an outstanding student who is proceeding from one year to another in the Bachelor of Journalism program. Donor: Canadian Corporate News. Established in 1995 to commemorate the 50th anniversary of Carleton's first courses in journalism.

Canadian Federation of University Women/Ottawa Scholarships

Three named scholarships — Dr. Ruth Bell Scholarship, Carol Shields Scholarship, Naomi Rayner Scholarship — valued at \$500 each. Awarded annually to women students at Carleton University continuing in undergraduate studies who have completed the equivalent of at least 5.0 credits beyond entrance requirements at the University and have demonstrated a high potential for university studies. To be eligible, the candidate must have maintained a high academic standing and be registered as a part-time student. Donor: Canadian Federation of University Women/Ottawa. First established in 1952 in honour of Dr. Alice E. Wilson, Revised 1989, 1993, 1996.

The Canadian Society for Chemistry Medal

Awarded annually to the student obtaining the highest academic standing in the penultimate year in the Honours Chemistry program. Established 1950. Revised 1983, 1985, 1990.

Canadian Society of Petroleum Geologists Undergraduate Student Award

An award, consisting of a certificate and one-year student membership in the Canadian Society of Petroleum Geologists, is given by the society on the recommendation of the Department of Earth Sciences, to an undergraduate student who has excelled in fields relating to petroleum geology. Established 1978.

Carleton Beaverbrook Awards for Freedom of the Press

Value \$300. Two awards are given annually, one on the recommendation of the Chair of the Department of History to a student enrolled in a history course, and the other on the recommendation of the Director of the School of Journalism and Communication to a student enrolled in a journalism course, who respectively submit the best essays that address the topic of freedom of the press and/or the right of access to the use of this medium by individuals and organizations. A case history method study will be favoured over a generalized essay. The awards will be provided from interest generated by The John Hanson Fund. Donor: J. Carlisle Hanson, Q.C. Endowed in 1982 in honour of John Hanson, a Canadian pioneer who, during his lifetime (1793-1820), established a settlement at Chamcook Island, New Brunswick. Revised 1992.

Carleton University Academic Staff Association Scholarship

Value \$1,500. Awarded annually to a student of high proficiency proceeding from one year of program to another in undergraduate studies at Carleton University. Donor: Carleton University Academic Staff Association. Established 1977.

Carleton University Caribbean Club Award

Value \$200. Awarded annually, if merited, on the recommendation of the Director of Student Awards, to an outstanding student who is a member of the Carleton Caribbean Club. Donor: The Carleton University Caribbean Club. Established 1991.

Carleton University In-Course Scholarships

These scholarships are named in honour of former Chancellors, Presidents and Chairs of the Board of Governors of Carleton University and are awarded to outstanding students proceeding from one year to another of a full-time undergraduate program at Carleton.

Carswell Company Book Award in Public Law

A book prize and certificate are awarded annually to the top full-time student in the Second, Third and Fourth year of any of the undergraduate Law programs. Donor: The Carswell Company Limited. Established 1965. Revised 1987, 1992.

Victor S. Castledine Scholarship

Awarded annually to a student in Economics or Business who, in the opinion of the Chair of the Department of Economics in counsel, has done outstanding work in the area of money, credit and banking studies. Donor: Victor S. Castledine, Esq. Endowed 1971.

CCH Canadian Limited Award in Taxation

A one-year's subscription to CCH's seven-volume Canadian Tax Reports awarded annually, on the recommendation of the Department of Law, to the student achieving the highest grades in tax law courses. Donor: CCH Canadian Limited. Established 1984.

Certified General Accountants Association of Ontario Award for Excellence

Value \$1,000. An annual award for excellence is given on the recommendation of the Director of the School of Business to a student graduating from Carleton University who has displayed outstanding achievement in accounting. The award is composed of a cash award of \$150 plus a credit of \$850 to be drawn down as and when the successful candidate wishes, for the purpose of defraying any fees related to courses in the CGA study program. The first drawdown on the credit must be made not later than 18 months after the date of notification to the successful candidate. Thereafter, the credit will be valid as long as the person is enrolled in the CGA program in Ontario. Donor: The Certified General Accountants Association of Ontario. Established 1981. Revised 1988.

Society of Chemical Industry Award

A gold key with the crest of the Society of Chemical Industry in front and the name of the winner, course, year and university on back is granted to the student who has the highest standing in the final year of the Honours program in Chemistry. The winner will also receive a year's subscription to the journal, Chemistry and Industry. Donor: Canadian Section, Society of Chemical Industry. Established 1961.

CHEZ-FM Research Award(s) in Mass Communication

Value \$1000. Awarded annually to support the cost of Honours Research Project(s) in the Mass Communication program. The award(s) are given to project(s) on radio broadcasting and issues related to broadcast regulation generally. The recipient(s) are determined annually on the recommendation of a panel selected by the Associate Director (Mass Communication) of the School of Journalism and Communication in conjunction with the donor. Donor: CHEZ-FM Inc. Established 1984.

CHEZ-FM Research Award in Sociology and Anthropology

Value \$600. Awarded annually, when merited, to a Fourth-year Honours student or a graduate student enrolled in a Sociology program. The award is intended to assist with the cost of a media-related research project, essay or thesis involving quantitative research on radio broadcasting, broadcast regulation generally, or con-

tributing to general theoretical development in media sociology. The recipient is chosen annually on the recommendation of a panel, selected by the Chair of the Department of Sociology and Anthropology, which includes a representative from CHEZ-FM Inc. Donor: CHEZ-FM Inc. Established 1989. Revised 1993.

Chipworks Award

Value \$500. Awarded annually, on the recommendation of the Faculty of Engineering and Design, to a student proceeding from Third to Fourth year of the Electrical engineering program who has demonstrated excellence in the field of microelectronics. Donor: Chipworks an Ottawa based microelectronics company. Established 1996.

CIPS Ottawa Section Scholarship

Value \$625. Awarded annually, on the recommendation of the Director of the School of Computer Science, to a full-time undergraduate student proceeding from one year to another of the Computer Science program. The award is composed of a cash award of \$500 plus a one-year CIPS student membership and admission to regular Ottawa Section meetings. Donor: Ottawa Section of the Canadian Information Processing Society (CIPS). Established 1992.

W.H. Collins Memorial Scholarship

Value \$8,000 over four years, (\$2,000 per year). Awarded annually to a student entering the First year of the Geology program. This award was endowed in 1994 to commemorate W.H. Collins for his outstanding achievement in the earth sciences including the directorship of the Geological Survey of Canada from 1920-1936.

Communications Law Prize

Awarded annually on the recommendation of a panel comprised of selected members of faculty who specialize in communications law, for excellence in the study of broadcast, press and telecommunications law. Donor: Leonard M. Bellam. Endowed 1983.

Scholarship in Comparative Economics

Awarded annually, if merited, on the recommendation of the Department of Economics, to an undergraduate or graduate student who has shown aptitude in the field of comparative economics. Established by Professor Richard Carson in memory of his parents, Robert L. and LeVerne N. Carson. Endowed 1991.

Duchess of Connaught Scholarship

The yield from the endowment of this historic scholarship has been made available to Carleton University by the Laurentian Chapter, I.O.D.E. The scholarship is to be awarded to an able student entering Carleton University, and may be held until graduation if merited, at which time a new award will be made. Donor: Laurentian Chapter I.O.D.E. Endowed at Carleton University 1960.

Consulting Engineers of Ontario Scholarship

Value \$500. Awarded annually, on the recommendation of the Dean of Engineering and Design, to an outstanding student proceeding from Third to Fourth year of an Engineering program. Donor: Consulting Engineers of Ontario (CEO). Established 1991.

Naomi Cook Scholarship Fund

Awarded annually to students with high academic standing entering Carleton University. Donor: The late Naomi Cook. Endowed 1967.

Michael Russell Coote Memorial Award

Awarded annually, on the recommendation of the Director of the School of Architecture, to a promising student who has successfully completed First year in the School of Architecture. Donors: Friends, family and colleagues of the late Michael R. Coote. Endowed 1983 in memory of Michael R. Coote, a member of the faculty since 1970 and Director of the School of Architecture from 1978 to 1982.

Jamie Corbet Memorial Award

Awarded annually, on the recommendation of the School of Computer Science, to an outstanding student who is proceeding from

one year to another in the School of Computer Science. Donor: Friends and family of the late Jamie Corbet. Endowed 1981.

Coulson Memorial Scholarship

Awarded annually, on the recommendation of the Chair of the Department of Classics, to an undergraduate student proceeding from one year to another of a Classics program. This award was endowed in 1990 in memory of Maria Pia Coulson and Tom Hunter Coulson. Donor: The estate of Louisa Gallo.

Jennie Shibley Cramm Scholarship

Awarded annually to a female student of high proficiency entering Carleton University from Nepean High School, Ottawa. Donor: The late Jennie Shibley Cramm. Endowed 1967.

W.H. Cramm Scholarship

Awarded annually to a male student of high proficiency entering Carleton University from Nepean High School, Ottawa. Donor: The late Jennie Shibley Cramm. Endowed 1967.

CSME Gold Medal

Awarded annually, on the recommendation of the Dean of Engineering and Design, to a graduating student in the Mechanical Engineering program for outstanding achievement. Donor: The Canadian Society for Mechanical Engineering. Established 1988.

Catherine Daumery Memorial Award for Botanical Collection

Value \$50, together with a book prize. Awarded annually, if merited on the recommendation of the Department of Biology, to a student who has submitted by November 1, an outstanding collection of mounted and identified flowering plants. Donor: Anonymous. Established 1953.

Bertha F. Davis Award in Religion

Awarded annually to an outstanding student enrolled in the B.A. or Honours program in the Department of Religion at Carleton University. Donor: Bertha Florence Davis. Endowed 1977.

W.R. Davis Engineering Scholarship

Value \$1,000. Awarded annually, on the recommendation of the Faculty of Engineering and Design, to an outstanding student entering the Fourth year of the Electrical or Mechanical Engineering program. Donor: W.R. Davis Engineering Ltd. Established 1988.

Deloitte & Touche Scholarships

Two scholarships valued at \$500 each. Awarded annually to the two students in the School of Business who have attained the highest overall average in the First and Second year of the Business program and are proceeding in the accounting stream. Donor: Deloitte & Touche. Established 1962. Revised 1990.

Director's Award in Environmental Science

Value \$200. Awarded annually to a student graduating from the Environmental Science program with outstanding academic achievement. Established 1997.

Josef Dlouhy Memorial Scholarship in Chemistry

Awarded annually, when merited, on the recommendation of the Department of Chemistry to a student proceeding from First to Second year of an Honours program in Chemistry, Biochemistry or any Combined Honours program in Chemistry. Preference will be given to a student intending to study inorganic or analytical chemistry. Endowed in 1997 by Dr. Joseph Dlouhy in honour and memory of his father, Josef Dlouhy.

Dobbie Regional Entrance Scholarships

Scholarships will be available for students entering Carleton University, to be divided equally among students from Ontario (except for the City of Ottawa), the Western provinces and the Territories, and Quebec and the Atlantic provinces. Donor: The late Jemema Grace Dobbie. Endowed 1967.

The Al Donaldson Award in Precambrian Geology

Awarded annually, when merited, to provide support for a student engaged in field-based B.Sc. thesis research in Precambrian terrains

of Canada. Proposals for research on fundamental unsolved problems will be given preference. Ontario students with demonstrable financial need are eligible to apply. Recipients will be chosen by the Precambrian Research Awards Committee, from applications submitted to the Chairman of the Department of Earth Sciences. Endowed by Professor Donaldson in 1996, the year of his retirement from full-time teaching at Carleton University, to encourage continuation of research in his principal area of geological research.

The Anne Donaldson Memorial Scholarship

Value \$500. Awarded annually, on the recommendation of the Director of the School of Journalism and Communication, to an outstanding student in the Third or Fourth year of the Bachelor of Journalism program who has demonstrated excellence in the area of Community Journalism. Established in 1998 by the Glebe Report Association Board in memory of Anne Donaldson to recognize her love of learning, devotion to her community and her leadership at the Glebe Report until November 1997. Donor: Glebe Report Association Board, community, friends and family.

Gary S. Duck Scholarship in Science

Awarded annually to students entering a Science program at Carleton University who have demonstrated a high potential for university studies. Donor: Gary S. Duck. Endowed 1998.

Lord Dundonald Chapter, I.O.D.E. Scholarship

Value \$200. Awarded annually to a student of superior standing and general proficiency, entering the final year of a degree program at Carleton University. Donor: Lord Dundonald Chapter, I.O.D.E. Established 1956.

Economics Scholarship

Value \$750. Awarded to the student or students entering the final year of the Honours program of studies, whose record of scholarship, in the opinion of the Department of Economics Scholarship Committee, merits special recognition. Established 1978.

Samuel L. Edelson Scholarship

Value \$250. Awarded annually to an outstanding student who is proceeding from one year of program to another at Carleton University. Donor: Members of the family. Established 1974.

George Edgerton and Nellie Erskin Cox Scholarships

Awarded annually to students entering Carleton University who have demonstrated a high potential for university studies. Bequeathed by Charles Cox in memory of his parents. Mr. Cox attended night classes at Carleton in the mid-1950's and having lived in Ottawa all of his life had a strong feeling for Carleton University. Endowed 1998.

Wilfrid Eggleston Award in Journalism

Value \$500. Awarded to the undergraduate with the best record in the Second-year Journalism Degree program. This award is named in honour of the late Dr. Wilfrid Eggleston, former Director of the School of Journalism. Donor: Anonymous. Established 1967.

Michael Elmarson Memorial Award

Awarded annually, when merited, on the recommendation of the Director of the School of Industrial Design, to a student in the Industrial Design program who has demonstrated an outstanding environmental awareness in an undergraduate Industrial Design project. Established by students and staff in memory of Michael Elmarson, a Carleton Industrial Design student. Endowed 1991.

Dr. Reginald T. Elworthy Award in Chemistry

Awarded annually, on the recommendation of the Chair of the Department of Chemistry, to an outstanding student in Second year Physical Chemistry who is continuing in the Honours Chemistry program. Endowed 1987.

Engineering Institute of Canada Award

Awarded annually, on the recommendation of the Faculty of Engineering and Design, to a Canadian citizen or permanent resi-

dent of high proficiency who is proceeding from First to Second year of the Engineering program. Donor: Ottawa Chapter of the Engineering Institute of Canada. Endowed 1989.

Enrichment Mini-Course Scholarship

Value \$500. Awarded annually, to two students who have participated in a Carleton University Enrichment Mini-Course prior to entering the First year of a program at Carleton University. The scholarships shall be given to the two candidates who have the highest scholastic standing of all candidates who are eligible for this award. Established in 1990 to commemorate the 10th Anniversary of the Enrichment Mini-Course Program. Donor: Instructional Television.

Ernst & Young Award

Value \$250. Awarded annually to the student with the highest standing in the First year of the Business program. Donor: Ernst & Young, formerly Clarkson, Gordon & Company. Established in 1962. Revised 1989.

Lil Fallis Scholarship

An award (or awards) given on the recommendation of the Director of the School of Business for excellence in the study of accounting and/or finance. Donor: Anonymous. Endowed 1980. Revised 1990.

Bob Farquharson Memorial Award in Journalism

Awarded annually to an outstanding student enrolled in a full-time undergraduate program in the School of Journalism and Communication at Carleton University. Preference will be given to a Third-year student who has indicated an interest in pursuing a career in newspaper and magazine journalism. Donors: Canadian Managing Editors Conference and the Toronto Globe and Mail. Endowed 1980.

The Education Foundation of the Federation of Chinese Canadian Professionals of Ontario Entrance Scholarship

Annual entrance scholarship of \$750. Awarded to a student entering the First year of the School of Architecture. The award is based on academic achievement and financial need. Established 1987.

The Education Foundation of the Federation of Chinese Canadian Professionals of Ontario Scholarship

Annual award of \$250, in the School of Journalism, to an outstanding student in a course devoted to problems of the mass media. Established 1986.

The Education Foundation of the Federation of Chinese Canadian Professionals of Ontario Scholarship

Annual award of \$250, in the School of Architecture, to an outstanding student in a course devoted to energy and form and related workshop. Established 1986.

Fitzroy Township Historical Society Scholarship

Awarded annually, when merited, on the recommendation of the Chair of the Department of History, to an outstanding student proceeding from Third to Fourth year of the Honours History program. Donor: The Fitzroy Township Historical Society. Endowed 1991.

E. Alison Flood Award in Physical Chemistry

Awarded annually, on the recommendation of the Chair of the Department of Chemistry, to a student who shows promise in the area of physical chemistry. Preference will be given to an outstanding student in the Second year physical chemistry course who is proceeding to the Third year of a Science program. Donors: Friends and former students of the late Dr. E.A. Flood, a principal scientist at the National Research Council, who in 1969 became a senior demonstrator in the Department of Chemistry. Endowed 1980. Revised 1988.

Lilian I. Found Award for Poetry

Offered annually for the best lyric of 50 lines or less submitted by an undergraduate of Carleton University by March 15. Details may be obtained from the Department of English. Donor: The late Mrs. Lilian I. Found. Endowed 1950.

Awards of the Embassy of France

For excellence in the study of French, two book awards are offered annually by the Embassy of France in Canada. Donor: Embassy of France. Established 1978.

Blair Fraser Memorial Award for Journalism Graduates

Offered annually to a Journalism student in his or her graduating year who, in the opinion of a board of selection, shows a marked aptitude for and interest in political reporting at the national and international level. Endowed 1969 in memory of Blair Fraser, Ottawa editor of Maclean's Magazine, by a group of his friends.

Jacob Freedman Scholarships

Awarded annually to outstanding students who are proceeding from one year of program to another at Carleton University. Donor: The late Jacob Freedman. Endowed 1967.

Department of French Scholarship

Value \$200. Awarded annually to an outstanding student entering Second or Third year in a Major or Honours program in French. Donors: Members of the Department of French. Established 1984.

Friends of Carleton Scholarships

Scholarships have been provided for general competition among students entering Carleton University at the senior matriculation level. Donor: The Friends of Carleton University. Established 1967.

GAC-MAC Undergraduate Scholarship in Earth Sciences

Awarded annually, on the recommendation of the Chair of the Department of Earth Sciences, to a deserving student who is proceeding from one year to another in the Honours Geology program. This scholarship was endowed in 1988 by the Geological Association of Canada and the Mineralogical Association of Canada in recognition of the support provided by undergraduate students when Carleton University hosted the "Ottawa 86" Annual Meeting.

Randall Geehan Memorial Scholarship in Quantitative Economics

Awarded annually, on the recommendation of the Chair of the Department of Economics, to a deserving Fourth-year Honours student or graduate student, whose studies emphasize quantitative work in economics. Endowed in 1990 by colleagues, family and friends in memory of Dr. Randall Geehan, who was a professor in the Department of Economics.

Awards of the Embassy of the Federal Republic of Germany

For excellence in the study of German, book awards are offered annually by the Embassy of the Federal Republic of Germany in Canada. Established 1955.

Irvin Gillespie Award in Economics

Awarded annually to undergraduate students who are registered in a program in the Department of Economics and who are in need of financial assistance. Endowed in 1997 by Irvin Gillespie, a member of the Department of Economics from 1964 to 1997, and friends.

Carl Gillis Memorial Award

Awarded annually, when merited, on the recommendation of the Carleton University Students' Association (CUSA), to an undergraduate student from Atlantic Canada who has demonstrated outstanding achievement in student, community, or national affairs and has maintained good academic standing. Endowed in 1996 by family and friends of Carl Gillis, B.A. 1992. Carl was a former CUSA Vice President and National Chair of the Canadian Federation of Students.

Glengarry Book Prize

Value \$150 gift certificate redeemable at the Carleton University Bookstore. Awarded annually by the Department of Housing and Food Services to the residence student enrolled in full-time undergraduate studies who has achieved the highest GPA among residence students returning from the previous year, and who is not

currently in receipt of another academic award from the University. Donor: Former Students of Glengarry House. Endowed 1983. Revised 1991.

Richard Glover Scholarship

Awarded annually, on the recommendation of the Department of History, to an outstanding student entering the Fourth year of the Honours History program. Endowed 1986.

Goldblatt Scholarship in Journalism

Awarded annually, on the recommendation of the Director of the School of Journalism and Communication, to a graduating student in the Bachelor of Journalism program who excels in the study of reporting on Canadian government and politics. Funded by the estate and friends of Murray Goldblatt, who shared his experience and passion for the media as a professor at Carleton for 19 years. Established 1996.

Golder Associates Award

Value \$500. Awarded annually, when merited, on the recommendation of the Chair of the Department of Civil and Environmental Engineering, to the student submitting the best Fourth-year civil engineering final project in the area of geo-environmental studies. Donor: Golder Associates Ltd. Established 1991.

Louis and Miriam Goldstein Book Award in Judaic Studies

Awarded annually to a deserving Carleton University student in Judaic studies, on the recommendation of the Department of Religion. Donors: Louis and Miriam Goldstein. Established in 1983 in honour of Carleton University's Fortieth Anniversary.

Mr. and Mrs. Louis L. Goldstein Book Award in Law

Awarded annually to a deserving Carleton University student in a Law program, on the recommendation of the Chair of the department. Donors: Mr. and Mrs. Louis L. Goldstein. Established 1975.

Marisa Ann Golini Memorial Scholarship in Journalism

Awarded annually, on the recommendation of the Director of the School of Journalism and Communication, to one or more deserving students showing exceptional ability in investigative reporting, community service and humanitarian interests who is proceeding from one year to the next in the Bachelor of Journalism program. Endowed in 1995 by Alfio and Esther Golini, parents of Marisa Ann Golini, a 1985 Carleton journalism graduate, and former news director of radio station CKQB-FM The Bear.

Krishnakumar Gopalan Memorial Award

Awarded annually to the Fourth-year student standing highest in the Mechanical Engineering program. Established in memory of Krishnakumar Gopalan, the top graduating student of the class of 1985 in the Mechanical Engineering program, who lost his life tragically within days of graduation. Donor: Friends of the late Krishnakumar Gopalan. Endowed 1985.

Margaret Graham Award

Value \$300. Awarded annually to the undergraduate student with the best overall academic average proceeding from Third to Fourth year of the Bachelor of Journalism program. This award is named in honour of Margaret Graham, who was one of the founding members of the Canadian Women's Press Club in 1904. Donor: The Media Club (Ottawa Branch). Established 1977.

Ian H. Griffith Memorial Scholarships

Awarded annually, if merited, to outstanding students proceeding from one year to another of a degree program in the Faculty of Science, preferably in the Integrated Science Studies program, and having some appreciation of the humanities. Donors: Mr. and Mrs. J. Griffith in memory of their son Ian H. Griffith, B.Sc., Carleton 1976.

Simon Guest Memorial Book Prize

Awarded annually, on the recommendation of the Chair of the Department of Earth Sciences, to a Fourth-year Honours Geology student. Endowed in 1988 by friends, family, the Geology Gradu-

ate Society and the Department of Earth Sciences in memory of Simon Guest, a Third-year geochemistry student who died tragically in the summer of 1988.

Peter Gerard Harris Memorial Award

Awarded annually on the recommendation of the School of Journalism and Communication to an outstanding student in the Third year of the Mass Communication program. Endowed 1985 by the family and friends of Peter G. Harris, a Carleton student who was named to the Deans' Honour List in June 1984, and who died tragically two months later.

Trevor A. Harwood Memorial Award

Awarded annually, on the recommendation of the Chair of the Department of Physics, to a promising student in need of assistance who is proceeding from one year to another in the combined Honours Geology and Physics program. Donor Anonymous. Endowed 1987.

Andrew S. Haydon Scholarship

Awarded annually to a student from a high school in the Regional Municipality of Ottawa-Carleton who is entering the Electrical or Systems and Computer Engineering program or the Computer Science program. Endowed in 1992 by business associates and friends of Andrew (Andy) Haydon in acknowledgement of 25 years of service to Ottawa-Carleton, and in recognition of his commitment to the future.

E.P. (Ted) Hincks Memorial Scholarship in Physics

Awarded annually, on the recommendation of the Department of Physics, to a student showing high proficiency in Physics and proceeding from one year to another of a full-time undergraduate program in Physics or in Physics and an allied discipline. Established in 1984 in memory of the late Professor E.P. (Ted) Hincks, D.Sc. (Carleton), F.R.S.C., former Chair of the Department of Physics and a pioneer in the area of high-energy physics.

E.P. Hincks Award of the Institute of Particle Physics

Value \$750. Awarded annually on the recommendation of the Department of Physics to an outstanding student in an Honours, Combined Honours, or Double Honours program in Physics at Carleton University. Donor: The Institute of Particle Physics. Established in 1984 in honour of the Institute's founding President, E.P. (Ted) Hincks, D.Sc., F.R.S.C. The late Professor Hincks played a seminal role in the development of high-energy physics in Canada and was a Chair of the Department of Physics at Carleton University. Revised 1987.

Rosemarie Hoey Award in English

Awarded annually, on the recommendation of the Chair of the Department of English, to a student in the First year of the English B.A. or Honors program for outstanding academic achievement in English 18.162. Established 1995.

J.M. Holmes Entrance Scholarship in Chemistry

Awarded annually on the recommendation of the Department of Chemistry to a student entering First-year Honours Chemistry. This award was endowed in 1986 to commemorate Professor Holmes' long association with high school and First-year students.

Professor James M. Holmes Scholarship in Chemistry

Awarded annually to an outstanding student proceeding from the Second to the Third year of an Honours Chemistry program. Donors: Friends and former students of Professor James M. Holmes. Endowed 1984.

Janet M. Holmes Memorial Scholarship

Value \$300. Awarded annually, when merited, to a promising student proceeding from the Third to the Fourth year of the Honours Chemistry program at Carleton University. Candidates will be selected by the Department of Chemistry. Donors: Professor and Mrs. J.M. Holmes. Established July 1973.

C.V. Hotson Memorial Scholarship

Awarded annually to an undergraduate student who maintains high academic standing and is active in student affairs. Donated by Carleton alumni and other friends in memory of Mr. Hotson, a 1950 Carleton Journalism graduate and former member of the Students' Council who returned to Carleton in 1953 to become Administrative Assistant to the President, and Executive Secretary of the Alumni Association, a position he held until his death in October, 1960.

Sara Helen Parry Hughes Memorial Scholarship

Awarded annually, on the recommendation of the Department of English, to an outstanding full-time student who is entering the Third year of the Honours English program. Endowed in 1984 by friends and family of Sara Helen Parry Hughes a Carleton University student.

Award of the High Commission of India

For excellence in the study of Sanskrit, a book award is offered annually by the High Commission of India. Established 1976.

International House Award

Awarded to a student in his or her graduating year attending Carleton University on a student visa who, in addition to maintaining the academic levels of the degree program, has been an active participant in extracurricular activities in the University. Donor: International House. Endowed 1972.

Allama Mohammad Iqbal Award

Awarded annually on the recommendation of the Department of Religion to an undergraduate student who has shown excellence in the field of Islamic studies. Donor: The Government of Pakistan. Endowed 1982.

Award of the Embassy of Italy

For excellence in the study of Italian, a book award is offered annually by the Embassy of Italy in Canada. Established 1971.

Mitch Jacobson Memorial Award in Photojournalism

Awarded annually to the student who, in the opinion of a selection committee appointed by the Director, is the best photojournalist in the School of Journalism and Communication. Donors: Friends of Mitch Jacobson. Established 1986.

Pauline Jewett Awards

Awarded annually to students entering a program at Carleton University from a high school in Canada. Established in 1990 by Pauline Jewett, a faculty member at Carleton from 1955 to 1972 and Director of the Institute of Canadian Studies. She was a Member of Parliament for two-and-a-half years in the mid-sixties and from 1979 to 1988. Dr. Jewett was Chancellor of Carleton University from 1990 to 1992.

Judith Johansen Memorial Award

Awarded annually on the recommendation of the School of Journalism and Communication to the Third-year Journalism student who submits the best series of interpretative reports during the academic year. Endowed in 1982 by friends, fellow students and teachers of Judith Johansen, B.J. 1970 and candidate for the degree of M.J.

George Johnston Poetry Award

Awarded annually, on the recommendation of the Chair of the Department of English, to the full or part-time student who submits the best poetry manuscript that particular year. Established in 1992, by members of the Department of English, in honour of Professor George Johnston, a distinguished poet and founding member of the Department of English.

Journalism Writing Style Book Award

Awarded annually as a book prize to a Journalism student, the writing style of whose class assignments shows exceptional merit. Donor: Anonymous. Endowed 1970.

Dr. Harry Katznelson Memorial Scholarship

Value \$100. Awarded annually to an outstanding student proceeding into an advanced year in the Honours Biology program. Donors: Friends of the late Dr. Harry Katznelson, B.S.A., M.Sc., Ph.D., F.R.S.C., Director of the Microbiology Research Institute, Federal Department of Agriculture. Established 1965.

Eldon Kaye Memorial Scholarship

Awarded annually, on the recommendation of the Chair of the Department of French, to an undergraduate or graduate student in the French program who has demonstrated the most promise in French literature. Endowed in 1989 in memory of Eldon Kaye, who was a professor in the Department of French.

Kipling Award

Value \$1000. Awarded annually, on the recommendation of the Dean of Engineering and Design, to a student graduating from the Engineering program who has demonstrated leadership ability and service to the engineering profession and/or the University community. The recipient is to be a Canadian citizen or permanent resident of Canada. Donor: Camp 12 of the Ritual of the Calling of an Engineer. Established 1986.

KPMG Scholarship

Value \$825. Awarded annually to the Third-year Business student standing highest in the Commerce program. Donor: KPMG. Established 1969. Revised 1987, 1989, 1990, 1997.

Marston LaFrance Memorial Award in English

Awarded annually, if merited, on the recommendation of the Department of English to outstanding student(s) entering the Fourth year of the Honours English program at Carleton University. Endowed 1976 in memory of the late Dr. Marston LaFrance, former Dean of the Faculty of Arts, Division I.

Charles Lazarus Scholarship

Awarded annually on the recommendation of the School of Journalism to a First-year Journalism student showing all-round academic excellence. Endowed in 1985 by the family of Charles Lazarus, in his honour.

Richard Lewar Entrance Scholarships

Value \$6,500 each. Awarded to an outstanding student entering the Faculty of Arts and Social Sciences, Faculty of Public Affairs and Management, Faculty of Science, Faculty of Engineering and Design, and a program in Science or Engineering related to Information Technology. These scholarships are renewable at \$2,000 per year. Donor Estate of Richard Lewar who was a Commerce student from 1974-1979, and was a long time supporter of Carleton University. Endowed 1998.

Francis C.C. Lynch Scholarships

Scholarships have been established for open competition among students entering or proceeding from one year to another in Arts, Social Sciences, Science, Business, Journalism, Engineering or Architecture. Donor: The late Francis C.C. Lynch. Endowed 1967.

George A. Lynn Memorial Scholarship

Awarded annually on the recommendation of a jury appointed by the Director of the School of Industrial Design, for excellence in the design of medical equipment. Donors: The friends and family of the late George A. Lynn. Professor Lynn was a well known Canadian industrial designer who, as one of the first Professors of Industrial Design, was a member of the faculty from 1975 until his untimely death in 1983. Endowed 1984.

David Carton MacDonald Memorial Award

Value \$300. Awarded annually, on the recommendation of the Chair of the Department of English Language and Literature, to the student with highest standing in the graduating class in Honours English who has a special interest in modern literature. Established 1987 in memory of David Carton MacDonald.

W.P. MacDonald Memorial Scholarship in Accounting

Awarded annually, on the recommendation of the Director of the School of Business, for proficiency in the study of accounting to an outstanding student who is proceeding from one year to the next in the Bachelor of Commerce program. Endowed in 1995 by the family of W.P. MacDonald.

Macdonald Club Awards in Music

Value \$500 each. Awarded annually to two outstanding students in the B.A. or Honours program in Music who have demonstrated a special interest in the creative arts. The recipients will be chosen by the Director of the School for Studies in Art and Culture on the recommendation of faculty members of the Music program. Donor: The Macdonald Club, a private club created to support and encourage the creative arts. Established 1981. Revised 1989, 1992.

Gavin Scott Macfarlane Memorial Scholarship

Awarded annually to an outstanding student, preferably in Honours, who is proceeding from one year of program to another at Carleton University. First donated in 1957 by Mrs. G.S. Macfarlane in memory of her husband, Lieutenant-Colonel Gavin Scott Macfarlane.

R.A. MacKay Award in Political Science

Awarded annually by the Department of Political Science to a student in good standing in accordance with terms that the Department may from time to time establish. Donor: The late Dr. R.A. MacKay. Endowed 1977.

School of Mathematics and Statistics Entrance Award

One or more annual awards for a student or students entering the First year of an Honours or Major program in the School of Mathematics and Statistics at Carleton University. The selection of the recipient or recipients will be based on the results of an annual Competition for High School students, with the decision being recommended by the Chair of the School in consultation with the Director of Student Awards and the School's High School Liaison Committee. Donors: Members of the faculty in the Department of Mathematics and Statistics. Established 1973.

Jeannette Matthey Memorial Scholarship

Awarded annually, on the recommendation of the Director of the School of Journalism and Communication, to a student proceeding from Third to Fourth year of the Journalism program who shows promise as a future radio journalist. Donors: Friends and colleagues of Jeannette Matthey, a former Carleton journalism student and an award-winning radio journalist with the CBC. Endowed 1993.

Roderick C. McDonald Memorial Scholarship in Engineering

Value \$300. Awarded annually to an Engineering student of high proficiency entering the Fourth year of program. Established by the University in memory of the late Roderick C. McDonald who, before his death in 1961, was a member of the Faculty of Engineering.

R.L. McDougall Award in English

Awarded annually to an outstanding student in the B.A. or Honours program in English. This award was established by friends, family and colleagues of Rob McDougall in recognition of his 25 years of service as a distinguished member of the Department of English and especially for his contribution as teacher, scholar and administrator in the field of Canadian studies. Endowed 1983.

McGregor Easson Scholarship

Awarded annually, to an outstanding student proceeding from one year to another of a full-time undergraduate program in the Arts or Social Sciences. Donor: The late Leah Easson. Endowed 1989.

Margaret McIrvine Scholarship

Awarded annually to outstanding students proceeding from one year of program to another in the School of Business. These scholarships are provided through the bequest of the late Margaret

McIrvine, a public servant for many years who was actively involved in women's issues. Endowed 1991.

D.F. McKechnie Award in Accounting

A book prize awarded, when merited, to a student in Business for proficiency in the study of accounting. Donor: D.F. McKechnie, C.A. Endowed 1951.

Violet McLaughlin Scholarship

Awarded annually to students entering or proceeding from one year to another at Carleton University. This fund was given by the late Violet McLaughlin, a resident of Ottawa, in memory of St. Patrick's College. Endowed 1984.

McNaughton Scholarship

The sum equal to tuition fees is awarded annually to a student entering the Fourth year of the Engineering program who has demonstrated a previous commitment to the McNaughton Centre and related IEEE activities. Established in honour of the late General Andrew G.L. McNaughton, scientist, soldier, politician, diplomat, and the inventor of the cathode-ray direction finder. The selection of the recipient will be made by the Faculty of Engineering and Design. Donor: International Electrical, Electronics Conference (IEEC), Inc. Established 1985. Revised 1989.

Luigi Mion Scholarship in Engineering

Awarded annually, when merited, on the recommendation of the Dean of Engineering and Design, to a student proceeding from one year to another of the undergraduate Civil Engineering program who has shown an interest in design or technological research in reinforced concrete. Donor: Luigi Mion, an Ottawa businessman involved in the manufacture of precast concrete products, who was a recipient of a 1992 Canada Award for Business Excellence. Endowed 1994.

Mr. Sub Scholarship

Value \$500. Awarded annually, on the recommendation of the Director of the School of Business, to a worthy student proceeding to Third or Fourth year of the Bachelor of Commerce program. Donor: Mr. Submarine Limited. Established 1997.

Dr. Frederick William Charles Mohr Scholarships

Scholarships have been made available for annual competition among students entering Carleton University or proceeding from one year of program to another and who come from communities within the following Ontario and Quebec counties: Ontario: Renfrew, Russell, Prescott, Glengarry, Stormont, Dundas, Grenville, Carleton, Lanark, Nipissing, Leeds; Quebec: Pontiac, Gatineau, Hull, Papineau, Argenteuil, Temiskaming. These awards are provided through the bequest of the late Dr. F.W.C. Mohr. Donor: The Frederick W.C. Mohr Estate. Endowed 1963.

Music Award

For the encouragement of a student displaying early excellence in music studies, an award is offered annually to the student registered in a Music program who has achieved the highest standing in the first 2.5 music credits. Donor: Anonymous. Endowed 1983. Revised 1992.

Jayashree A. Nagpur Memorial Award

Value \$100. Awarded annually on the recommendation of the Department of English to an outstanding student in the English program at Carleton University. Donor: Anant L. Nagpur. Established 1976.

National Capital Harvard Business School Alumni Club Book Prize

A contemporary book published by the Harvard Business School and a certificate are awarded annually, on the recommendation of the Dean of the Faculty of Engineering and the Directors of the respective schools, to an outstanding student proceeding from Second to Third year in each of the following areas: the Faculty of Engineering and Design, Schools of Business, Computer Science and Journalism and Communication. Donor: National Capital Harvard Business School Alumni Club. Established 1991.

Betty Nesbitt Memorial Award in Biology

Awarded annually to a student entering the Third year of a Bachelor's Degree program in Biology, who, in the opinion of the Department has shown exceptional promise in the field of biology. Preference will be given to a student in a faculty other than the Faculty of Science. Donors: Friends of the late Mrs. H.H.J. Nesbitt. Endowed 1976.

H.H.J. Nesbitt Scholarship in Biology

Value \$150. Awarded annually to an outstanding student proceeding from the Third to Fourth year of the Honours program in Biology at Carleton University. Established 1951, in memory of Mr. and Mrs. T.E. Clendinnen, by their daughter.

Barrington Nevitt Memorial Award

Awarded annually when merited, on the recommendation of the Director of the School of Industrial Design, for excellence in the Industrial Design Seminar. Established in 1995 by Jacques Giard and Mercedes Ballem in memory of Barrington Nevitt, a well known communications expert and a regular contributor to the Industrial Design Seminar.

Marjorie Nichols Memorial Award

Awarded annually, on the recommendation of the Director of the School of Journalism and Communication, to a graduating student in the Bachelor of Journalism program who shows exceptional promise as a future journalist. Preference will be given to a female candidate. Donors: Friends and colleagues of Marjorie Nichols, a highly respected journalist who was a political reporter for nearly 25 years. Endowed 1992.

Helen Nininger Scholarship in Music

Value \$500. Awarded annually, on the recommendation of the Faculty members of the Music program, to an outstanding full-time student proceeding from one year to another of the Music program. Established in 1998 by the Canadian Federation of University Women/Ottawa in memory of Helen Nininger, a long time and active member of the federation.

James Nolan Memorial Award

Awarded annually to a student in Business, for proficiency in the study of accounting. Donors: The family and friends of the late James P. Nolan, B.Com. Carleton 1977. Endowed 1977.

F.K. North Award in Geology

A book is awarded annually, on the basis of outstanding performance, to a student in final year of the Honours Geology program at Carleton University. This award was provided by friends and colleagues of Ken North, in recognition of his 19 years of service as a renowned teacher of geology at Carleton University, and in particular recognition of his timely and articulate statements that led to careful re-evaluation of Canada's petroleum reserves. Donors: Friends and colleagues of Dr. North. Endowed 1981.

Dr. Iain Ogle Memorial Scholarship

Awarded annually, on the recommendation of the Chair of Earth Sciences, to an outstanding student who is proceeding from one year to another of a Geology program. Endowed 1993 by friends of Dr. Iain Ogle.

Ontario Association of Architects Awards

Value \$2,400. Awarded annually to a deserving student enrolled in the Second year of the School of Architecture program an award of \$1,200; and to a deserving student enrolled in the Third year of the School of Architecture program an award of \$1,200. Donor: Ontario Association of Architects. Established 1972.

Ontario Hydro Engineering Award

Value \$2,400. Awarded annually, when merited, on the recommendation of the Dean of Engineering and Design, to a student proceeding from First to Second year of the Engineering program who is specializing in electrical, mechanical or environmental engineering. Donor: Ontario Hydro. Established 1986. Revised 1987, 1988, 1995.

Ontario Professional Engineers Foundation for Education Entrance Scholarships

Value \$1,200. Two scholarships are awarded annually to students of high proficiency who are entering the Engineering program at Carleton University from high school. Donor: The Ontario Professional Engineers Foundation for Education. Established 1961. Revised 1989, 1991, 1994.

Ontario Professional Engineers Foundation for Education Scholarships

Value \$600 each. Four scholarships are awarded annually to Engineering students of high proficiency proceeding from one year of program to another in Carleton University. Donor: The Ontario Professional Engineers Foundation for Education. Established 1961. Revised 1989, 1991, 1994.

Bettina Oppenheimer Memorial Scholarship in Music

Awarded annually to an academically outstanding student within 6.0 credits of completion of the Bachelor of Music degree. The recipient will be chosen by the Director of the School for Studies in Art and Culture on the recommendation of the faculty members of the Music program. Donor: E.M. Oppenheimer. Endowed 1982. Revised 1992.

Ordine Italo-Canadese Scholarship

Value \$500. Awarded annually, on the recommendation of the Department of Italian, to a Canadian citizen or permanent resident who is proceeding from one year to another in a full-time program in Italian (B.A. or Honours) and who has shown high proficiency and interest in the study of Italian. Donor: Ordine Italo-Canadese. Established 1988.

Robert E. Osborne Award

Awarded annually, on the recommendation of the Chair of the Department of Religion, to an undergraduate or graduate student in the Religion program. Preference, in order, will be given in the areas of New Testament, Biblical and other forms of religious studies. Endowed 1986 in memory of Robert E. Osborne, who was a professor in the Department of Religion.

The Osgoode Society Legal History Book Prize

Two books awarded annually, on the recommendation of the Chair of the Department of Law, to a student who merits special recognition for work in legal history. Donor: The Osgoode Society. Established 1993.

Ottawa Citizen Scholarship

Value \$1,500. Awarded annually to a full-time student proceeding from First to Second year of a degree program who comes from a community within eastern Ontario or western Quebec. The selection will be made on the basis of high academic standing and community involvement. Donor: The Ottawa Citizen. Established 1955. Revised 1997.

Ottawa Citizen Scholarship in Journalism

Value \$1,500. Awarded annually to the top full-time undergraduate student proceeding from Third to Fourth year of the Journalism program. Donor: The Ottawa Citizen. Established 1969. Revised 1997.

Ottawa Film Society Scholarship for Film Studies

Awarded annually to an outstanding student (or students) entering the Fourth year of the Film Studies Honours program. The recipient will be chosen by the Director of the School for Studies in Art and Culture on the recommendation of faculty members of the Film Studies program. Donor: Ottawa Film Society/Ciné-club d'Ottawa. Endowed 1994.

Ottawa Human Resources Professional Association Award

Value \$500. Awarded annually, on the recommendation of the Director of the School of Business, to a student enrolled in the Concentration in Strategic Human Resources Management. Donor: Ottawa Human Resources Professional Association. Established 1998.

Ottawa Hydro Entrance Scholarships

Value \$1000. Two scholarships are awarded annually, one to a student entering the Electrical Engineering program and one to a student entering the Computer Science program from an Ottawa or Vanier High School. Established in 1990 to commemorate the 75th anniversary of Ottawa Hydro. Donor: Ottawa Hydro.

Ottawa Ladies' College Scholarships

Provided for annual competition among undergraduates for the various disciplines. Endowed 1967.

Ottawa Women's Canadian Club Scholarship

Awarded to an outstanding student who is a Canadian citizen proceeding from one year of program to another of the undergraduate Canadian Studies program. Endowed 1946. Revised 1977, 1983.

Oxford University Press Award in Law

A prize of a copy of the Oxford Companion to Law awarded annually, on the recommendation of the Department of Law, to a deserving student pursuing the study of law at Carleton. Donor: Oxford University Press. Established 1984.

The Page and Steele School of Architecture Scholarship

Value \$200. Awarded annually to an outstanding student enrolled in the School of Architecture at Carleton University. Donor: Page and Steele Architects. Established 1967. Revised 1992.

Dr. C. Stewart Parsons Scholarship in Engineering

Awarded annually to an entering or continuing student in the Faculty of Engineering and Design. Endowed 1984 by Mrs. C.S. Parsons in memory of her husband, a former Director of the Bureau of Mines.

Charles and Helen Pattenson Scholarships

Awarded annually to students entering Carleton University who have demonstrated a high potential for university studies. Mr. Pattenson was engaged in engineering research and development in the Radio and Electrical Engineering Laboratories of the National Research Council, Ottawa, Canada, from 1940 to his retirement in 1976. Donors: The late Charles F. and Helen M. Pattenson. Endowed 1980.

Stewart G. Paul Memorial Award

Awarded annually, on the recommendation of the Director of the School of Business, to a deserving student continuing in the Commerce program. Preference will be given to a disabled student. Established in 1992 in memory of Stewart G. Paul by his wife and children. Mr. Paul enjoyed a successful career in business in Ottawa and throughout Canada. Endowed 1992.

Ottawa Section of the Petroleum Society of CIM Annual Award

Value \$500. Awarded annually, when merited, on the recommendation of the Chair of the Department of Earth Sciences, to a Canadian citizen or permanent resident proceeding to the Third or Fourth year of a degree program in Science or Engineering. Preference will be given to a student who has demonstrated an interest in the petroleum industry. Donor: Ottawa Section of the Petroleum Society of CIM (a constituent Society of the Canadian Institute of Mining and Metallurgy). Established 1987.

The Robert Pickard Scholarship in Environmental Engineering

Awarded annually, when merited, on the recommendation of the Dean of Engineering and Design, to an outstanding full-time student proceeding from Third to Fourth year of the Engineering program who has demonstrated an interest in problems in environmental engineering. Preference will be given to candidates who attended a high school within the Regional Municipality of Ottawa-Carleton, and have shown an interest in municipal engineering. Endowed in 1990 by colleagues, friends and family of Robert Pickard, Eng. Cert. 1953, Commissioner of Environmental Services (retired) for the Regional Municipality of Ottawa-Carleton.

Charles Pinhey Award

Awarded to a student entering the First year of Business at Carleton University from a secondary school in the Regional Municipality of Ottawa-Carleton. The sum of \$300 will be awarded in the student's First year, and \$200 for each succeeding year provided the student is registered as a full-time student at Carleton University and maintains scholarship levels in the Business program. This award is based on high academic performance and on financial need. Donor: The Ottawa-Carleton Board of Trade. Established 1974.

Pratt & Whitney Canada (Undergraduate) Scholarships

Value \$1,500 each. Awarded annually, when merited, on the recommendation of the Department of Mechanical and Aerospace Engineering, to two students of high academic standing who are specializing in gas turbine technology and who are proceeding from Third to Fourth year of the program. Established 1996.

Prince Memorial Achievement Award

A book award valued at \$100. Awarded annually to an outstanding graduating Honours student in Economics. The student will be selected on the recommendation of the Award Committee of the Department of Economics. Book(s) will be selected by the Department in consultation with the recipient. Endowed 1984 by Professor Kanta Marwah.

John R. Pugh Scholarship

Awarded annually, on the recommendation of the School of Computer Science, to an outstanding, full-time student proceeding from Second to Third year of the Bachelor of Computer Science program. Endowed in 1996 in honour of John Pugh, Director of the School of Computer Science from 1986-90, 1991-94.

Purvins Memorial Award

Value \$100. Awarded annually, when merited, on the recommendation of the Director of the School of Industrial Design to a full-time student proceeding from one year to another in the Industrial Design program. Selection of the recipient will be based on creative applications of materials and technologies in industrial design projects. Donor: The family of the late Laimons Purvins who was a technician in the School of Industrial Design. Established 1990.

James H. Rattray Memorial Scholarship

Value \$500. Awarded annually to a student entering First-year Engineering at Carleton University. Donor: The late James H. Rattray, M.C. Endowed 1961.

Don Reid Memorial Scholarship

Awarded annually, when merited, on the recommendation of the Director of Student Awards after consultation with the Department of Physical Recreation and Athletics, to a full-time student proceeding from one year to another of an undergraduate program. The selection will be made on the basis of outstanding academic achievement and involvement in interuniversity sports. Established by funds donated in honour of the late Don Reid, a 1978 Carleton graduate and member of the Ravens basketball team. Endowed 1990.

Peter Reilly Scholarship

Awarded annually to a student entering either the Third or Fourth year of a degree program in the School of Journalism and Communication who shows talent, aptitude and concern for journalistic disciplines. Preference will be given to a student entering Fourth year who has demonstrated a potential for effective use of the medium of television, current affairs and/or documentary programs. Donors: Friends of the late Peter Reilly. Endowed 1978.

Riordon Scholarship

Awarded annually to outstanding students entering an Engineering program at Carleton University. Donor: The Riordon Family. Endowed 1998.

Risk and Insurance Management Society Award of Excellence

Four awards are given annually by the Canadian Capital Region of the Risk and Insurance Management Society (RIMS) to students enrolled at Carleton University who have completed at least 4.0 credits towards a degree and who have displayed outstanding academic achievement. The award is composed of a credit value of \$500 for the purpose of defraying fees related to courses in the Canadian Risk Management Certificate Program offered through the Canadian Capital Region Chapter of RIMS. Donor: Canadian Capital Region Chapter of RIMS. Established 1994.

Rogers Communications Award in Mass Communication

Awarded annually to an outstanding Fourth-year honours student enrolled in the Mass Communication program. The recipient will be selected by the Awards Committee of the Mass Communication program. Endowed 1991 by Rogers Ottawa Ltd.

Rogers Communications Award in Television Journalism

Awarded annually on the recommendation of the School of Journalism to the student graduating from the Bachelor of Journalism program who shows the most promise as a television journalist. Endowed 1991 by Rogers Ottawa Ltd.

Rolls-Royce Scholarship

Value \$1,500. Awarded annually, on the recommendation of the Faculty of Engineering and Design, to a student proceeding from Third to Fourth year of the Engineering program who has demonstrated an interest in aerospace engineering and displays great promise in this field. Donor: Rolls-Royce Industries Canada Inc. Established 1988.

Herman and Zelda Roodman Award in Journalism

Value \$500. Awarded annually, on the recommendation of the Director of the School of Journalism and Communication, for excellence in reporting, to a graduating student in the Bachelor of Journalism program. Donors: Mr. and Mrs. Herman S. Roodman. Established 1965. Revised 1980, 1988, 1995.

R.L. Rosenberg Memorial Scholarship in Mathematics

A scholarship awarded on the recommendation of the Department of Mathematics and Statistics to an outstanding student entering a First-year Honours program in the Department of Mathematics and Statistics at Carleton University. Endowed in 1986 by the daughters, friends and academic colleagues of the late Reuben L. Rosenberg, who served this University and his Department, with distinction.

Barbie Ross Memorial Award

Value \$500. Awarded annually on the recommendation of the Residence University Management and Policy Board to a full-time student in good academic standing who has demonstrated active participation in the affairs of the Carleton University residence community. Donors: Friends and family of the late Barbie Ross. Endowed 1983.

Annie Fraser Roy Scholarships

Awarded annually to an in-course student or students enrolled in a program, the majority of whose courses are in literature. Donor: The late Marjorie T. Roy. Endowed 1982.

James and Jane Fraser Roy Scholarships

Awarded annually, if merited, to outstanding students proceeding from one year to another in a degree program at Carleton University. Donor: The late Jean Roy. Endowed 1975.

J. Lansing Rudd Scholarship

Awarded annually to a superior student progressing from one year of program to another at Carleton University. Donor: The late J. Lansing Rudd. Endowed 1967.

Department of Russian Undergraduate Award

Awarded annually on the recommendation of the Department of Russian to an outstanding undergraduate student pursuing a B.A. or Honours degree in the Department of Russian. Donors: Members and friends of the Department of Russian. Endowed 1983.

Celia Ruygrok Memorial Scholarship

Awarded annually on the recommendation of the Dean of Public Affairs and Management to a deserving student proceeding from Second to Third year of the Criminology and Criminal Justice Concentration. Endowed in 1986 by family and friends of the late Celia Ruygrok, B.A. 1985.

Derek Rymerson Memorial Scholarship

Awarded annually, on the recommendation of the Director of the School of Computer Science, to an outstanding student proceeding from Third to Fourth year of the Computer Science program. Endowed in 1992 by the family and friends of Derek Rymerson.

Jacques and Hélène Sabourin Memorial Scholarship

Awarded annually, on the recommendation of the Director of the School of Architecture, to the student showing the greatest proficiency in a course devoted to lighting for architecture. Donated by the Illuminating Engineering Society and its members in memory of Jacques and Hélène Sabourin who were active in the field of illumination and who tragically lost their lives in an automobile accident in 1984. Endowed 1985.

St. Patrick's College Scholarship

Awarded annually to an entrance or in-course student or students in the humanities and social sciences, with preference being given to students with physical disabilities. Endowed in 1980 to perpetuate the name and traditions of St. Patrick's College.

Samuel Sair Prize in Business Ethics

Awarded annually, on the recommendation of the Director of the School of Business, to an outstanding student who is studying business ethics and is a Canadian citizen or landed immigrant. Endowed 1985. Revised 1997.

Professor H.I.H. Saravanamuttoo Scholarship in Mechanical and Aerospace Engineering

Awarded annually, when merited, on the recommendation of the Chair of the Department of Mechanical and Aerospace Engineering to students proceeding from Third to Fourth year of the program. Selection will be made on the basis of high academic standing, with consideration given to demonstrated leadership in student societies. Endowed in 1998 by family, friends, colleagues and former students of Herb Saravanamuttoo in honour of his retirement after 28 years with the Department of Mechanical and Aerospace Engineering at Carleton University.

Nicholas C. Scolozzi Scholarship in Architecture

Awarded annually, on the recommendation of the Director of the School of Architecture, to a deserving student who excels in the Fourth-year design studio of the Architecture program. Endowed in 1997 by family and friends in memory of Nicholas Scolozzi, a former Carleton University architecture student.

Lawrence Segal Memorial Fund

Established as a book prize for a student enrolled in the School of Business. Donors: The friends of the late Lawrence J. Segal, B.Com. Carleton, 1961. Endowed 1970. Revised 1986.

Richard J. Semple Memorial Award in Mathematics

Awarded annually to an outstanding student enrolled in an Honours Mathematics program and proceeding to Third or Fourth year of studies at Carleton University. Donors: Friends and family of the late Richard J. Semple. Endowed 1977 in memory of Richard J. Semple, a long-time faculty member of the Department of Mathematics.

Eric Sigurdson Award

Awarded annually to an outstanding student in the Computer Systems Engineering program. Donors: Friends and colleagues of the late Professor Eric L. Sigurdson, former member of the Department of Systems and Computer Engineering, in recognition of his contributions to teaching, research and development, and to the establishment of the Computer Systems Engineering program. Endowed 1982.

E. Norman Smith Memorial Award

Value \$500. Awarded annually to a Third-year Bachelor of Journalism student who, in the opinion of a selection committee appointed by the Director of the School of Journalism and Communication, shows great promise as a newspaper journalist. Established in 1995 in honour of E. Norman Smith, a founder of both the Ottawa Journal and The Canadian Press. Donor: Granddaughter Sheena Pennie, a principal of Delta Media.

Kenneth F. Smith Memorial Award in Journalism

Awarded annually, on the recommendation of the School of Journalism and Communication, to the First-year student standing highest in the Honours Journalism program. Donated by relatives, friends and business associates in honour of the late Kenneth Smith, a Carleton Journalism graduate who became a noted business writer and editor with the Canadian Press. Endowed 1985.

Richard R. Snell Memorial Award in Journalism

Awarded annually, on the recommendation of the School of Journalism and Communication, to an outstanding student in the Journalism program who shows exceptional abilities in investigative reporting. Donated by friends and relatives in honour of Richard R. Snell, a Carleton Journalism graduate and Southam Fellow, who following a notable newspaper career became a leader in the field of public sector communications. Endowed 1988.

Mercy Neal Southam Entrance Scholarships

Entrance scholarships will be awarded annually, if merited, to students entering the First year of Arts, Social Sciences, Journalism, Commerce, Science, Engineering, Architecture, Industrial Design or Public Administration at Carleton University. Endowed in 1949. Under the terms of bequest of the late Wilson Mills Southam, the scholarships are in memory of his grandmother, Mercy Neal Southam (1809-1887), "Sturdy pioneer of the Southam Family in Canada."

Award of the Embassy of Spain

For excellence in the study of Spanish, a book award is offered annually by the Spanish Embassy in Canada. Established 1960.

Bette Spooner Award in Classics

Value \$300. Awarded annually, on the recommendation of the Department of Classics, to a student in the Third or Fourth year of the B.A. or Honours program in Classical Civilization. Donor: Family and friends of Bette Spooner. Established 1993.

Randell Stanton Memorial Book Prize

Awarded annually to an outstanding full-time student proceeding from Second to Third year. This prize is awarded in alternate years to a student in the English Language and Literature program and the Architecture program. The book prize is named in honour of an alumnus of Carleton University who studied and loved the disciplines of English literature and architecture. Donor: Family and friends of the late Randell Stanton. Endowed 1990.

Ben and Mary Steinberg Foundation Scholarships

Awarded to outstanding students who may be in need of financial assistance in the furtherance of their studies. Established 1978.

Stentor Scholarships in Communications Engineering

Value \$2000 each. Two scholarships are awarded annually on the recommendation of the Faculty of Engineering and Design, to outstanding Third- or Fourth-year students in the Department of Systems and Computer Engineering who are specializing in communications engineering. Donor: Stentor Resource Centre Inc. Established 1997.

Irene Gertrude Stitt Scholarship Fund

Awarded annually to students of high proficiency proceeding from one year of program to another at Carleton University. The fund has been made possible by a bequest of the late Edith May Stitt, in memory of her sister, Irene G. Stitt. Endowed 1966.

John and Carol Strong Book Prize

Awarded annually, on the recommendation of the History Department, to the student who has written the best in-class essay on a topic relating to China, Japan or Russia's involvement in Asia. This prize was established in 1997 by friends and colleagues to honour Professor Strong's pioneering efforts to develop the teaching at Carleton of the histories of these areas.

Barbara Sudall Book Prize

Awarded annually on the recommendation of the Department of English to an outstanding part-time student in the B.A. or Honours program in English. Endowed 1986 by friends and colleagues of Barbara Sudall in recognition of her twenty-two years of service as the Faculty Administrator in the Faculty of Arts.

Awards of the Ambassador of Switzerland to Canada

For excellence in the study of French, German, and Italian, book awards are offered annually by the Ambassador of Switzerland to Canada. Established 1953.

Imam Tawfiq Shaheen Memorial Scholarship

This scholarship was established in 1998 by the Ottawa Muslim Association in memory of the late Dr. Tawfiq Shaheen who was the Imam of the Ottawa Mosque from 1980-1997. It is awarded annually, when merited, on the recommendation of the Dean of the Faculty of Arts and Social Sciences, to a full-time student enrolled in an undergraduate or graduate program who undertakes a research project embracing, among other Islamic subjects, Islamic religion, Islamic jurisprudence, Islamic art, Islamic history, Islamic culture, Islamic ethics or Islamic philosophy.

David A. Thomas Scholarship in Computer Science

Awarded annually, on the recommendation of the School of Computer Science, to an outstanding full-time student, proceeding from one year to another of the Bachelor of Computer Science program. Donors: Friends and colleagues of David A. Thomas, a longtime member of the University community, in recognition of his contribution to the development of academic programs and computing environment at the University and in recognition of his special interest in, and support of, students. Endowed 1991.

Michael Thompson Scholarship in English

Awarded annually, on the recommendation of the Chair of the Department of English, to the full-time Honours English student with the highest GPA who is proceeding from Third to Fourth year of the English program or from Fourth year to Carleton's Master of Arts program in English. Endowed in 1992 by colleagues, friends and former students in honour of Professor Michael Thompson's many contributions to the Department and to the University.

Thomson Award for Reporting

Value \$300. Awarded annually to a student proceeding from Third to Fourth-year Honours Journalism judged to be outstanding in reporting. Donor: Thomson Newspapers. Established 1970.

Henry Marshall Tory Award

Presented annually to an outstanding graduating student who has shown a high degree of academic application, has indicated an interest in the University by broad participation in extracurricular activities of a constructive nature, has indicated qualities of leadership, and has attended Carleton University for at least three Fall/Winter sessions. Each candidate is nominated by three members of the Students' Association and selection is made by a committee composed of the President of the University, a member of the Faculty chosen by Senate, the Director of Student Awards, and three students chosen by the Students' Council. The winner's name is inscribed on the master trophy and the student receives a miniature replica. The award was established in 1950 by the Students' Council of Carleton College.

Hubert Travers Scholarship

Awarded annually to outstanding students entering or proceeding

from one year to another of a full-time undergraduate program at Carleton University. Preference shall be given to students from the Ottawa area. Endowed 1983.

Underhill Prize

Value \$200. Awarded annually, on the recommendation of the Department of History, to the graduating student with the highest overall GPA in the Honours History program. Endowed 1986.

United Empire Loyalists Scholarship in Canadian Studies

Value \$250. Awarded annually, when merited, on the recommendation of the Director of the School of Canadian Studies, to an outstanding student proceeding from Second to Third year of the Canadian Studies program. Established in 1998 by the Sir Guy Carleton Branch of the United Empire Loyalists.

Vered Foundation Scholarships

Two scholarships valued at \$500 each; one awarded annually, if merited, to an Engineering student in Civil Engineering; the second scholarship awarded annually, if merited, to a student who is proceeding from one year of course to another in a degree program in Political Science. Donor: The Vered Foundation of Ottawa. Established 1975.

Vistas Scholarship

Value \$500. Awarded annually to a student from the City of Ottawa, Alta Vista Municipal Ward, who is entering the First year of the Bachelor of Journalism program. Donor: Alta Vista Community Newspaper. Established 1990.

L.N. Wadlin Scholarship in Mathematics

Awarded annually to a student proceeding from one year to another at Carleton University who has shown excellence in the study of mathematics. Donor: The late Lorenzo N. Wadlin. Endowed 1965.

Wainwright Scholarships

Awarded annually to a student or students studying Canadian history. Donor: Miss Dora I.I.S. Wainwright. Endowed 1974. Revised 1980.

Jessie and Wreford Watson Award in Geography

Awarded annually to the outstanding student entering the final year of Honours Geography at Carleton University. Dr. Wreford Watson, then Chief Geographer of Canada, founded geography at Carleton in 1949. One year later he was joined by Mrs. Watson and together they lectured in geography at Carleton until 1954. Donors: Friends, faculty and alumni of the Department of Geography. Endowed 1980.

R.A. Wendt Book Prize

Awarded on the recommendation of the Department of Psychology, preference will be given to a student in an undergraduate degree program for work done in the history of psychology. This fund was established on the occasion of Professor Wendt's retirement, in recognition of his contributions over many years to the Department of Psychology, the Faculty of Social Sciences, and to the University community. This prize is intended to assist the recipient to build a personal library.

Elizabeth White Memorial Award for Zoological Collection

Value \$50, together with a book prize. Awarded annually, if merited, on the recommendation of the Department of Biology to a student who has submitted, by November 1, an outstanding collection of insects or arachnids, properly preserved and identified. Donor: Anonymous. Established 1953.

Donald R. Wiles Scholarship in Chemistry

Awarded annually, when merited, on the recommendation of the Department of Chemistry to a student proceeding from First to Second year of an Honours program in Chemistry, Biochemistry or any Combined Honours program with Chemistry. Preference will be given to a student intending to study inorganic or analytical chemistry. Donor: Dr. Donald R. Wiles and friends. Endowed 1990.

Donald R. Wiles Scholarship in Environmental Science

Awarded annually, when merited, on the recommendation of the Director of the Institute of Environmental Science, to students proceeding from Second to Third year of the Environmental Science program. Donor: Dr. Don Wiles. Endowed 1998.

Wilgar Memorial Award in English

A book prize awarded to a Carleton University undergraduate who has shown excellence in essay-writing. Established 1951, in memory of the late W.P. Wilgar, Assistant Professor of English at Carleton University, 1948-50. Endowed 1952.

Goldie Wilkinson Scholarship

Awarded annually, on the recommendation of the School of Computer Science, to an outstanding student proceeding from First to Second year of the Bachelor of Computer Science program. Donors: Friends and colleagues of Goldie Wilkinson, a long time member of the University community, in recognition of her special interest in, and support of, students. Endowed 1988.

Kenneth R. Wilson Memorial Award for Journalism Graduates

Offered annually to a student graduating in Journalism who, in the opinion of a board of selection, shows exceptional promise as a future reporter and interpreter of Canadian affairs. Endowed 1953, in memory of Kenneth R. Wilson, Ottawa Editor of The Financial Post, by a group of his personal friends.

Morley E. Wilson Scholarship

Awarded annually to an outstanding student in Honours Geology who is proceeding from one year of program to another at Carleton University. Donor: The late M.E. Wilson, Sessional Lecturer in Geology at Carleton University, 1947-1953. Endowed 1975.

Phyllis Wilson Award in Journalism

Awarded annually to the top student in Second-year reporting. The recipient is selected by the faculty members of the School of Journalism and Communication on the basis of recommendations from the Second-year reporting instructors. Donors: Friends and former students of Professor Phyllis Wilson. Endowed 1982.

Herbert I. Wolf Award

Awarded annually to an undergraduate student enrolled in a full-time program at Carleton University. The award is given in memory of Herbert I. Wolf, the son of the donor, who died in active service. Donor: George M. Wolf. Endowed 1981.

Women's Business Network Association of Ottawa Scholarship

Value \$2,000. Awarded annually, on the recommendation of the Director of the School of Business, to an outstanding full-time undergraduate student proceeding to Third or Fourth year of the Commerce program. The recipient is to be a Canadian citizen or permanent resident. Donor: Women's Business Network Association of Ottawa, an association created to promote, improve and profile women in business. Established 1987. Revised 1990.

Gordon J. Wood Scholarships in English

Value \$350 each. One to a full-time student in English proceeding from Second to Third year, who has taken at least 3.0 credits in English at Carleton; one to a full-time student in English proceeding from Third to Fourth year, who has taken at least 4.0 credits in English at Carleton University. The assessment is made on the basis of overall grades for the year, including Summer courses (if any) from the previous Summer. English marks will be given particular consideration if necessary in the ranking of qualifying students. Donor: Gordon J. Wood, Professor of English, Carleton University. Established 1974.

Susan Joan Wood Memorial Scholarship

Awarded annually on the recommendation of the Department of English. Preference will be given to a student proceeding from the Third to Fourth year of an Honours program in English with an emphasis on Canadian literature. Donor: Friends and colleagues of Susan Joan Wood. Endowed 1982.

Hume Wrong Scholarship

Established by Mrs. Hume Wrong in memory of her late husband. Awarded annually to the leading student in the Third year of History or Political Science proceeding to his or her final Honours year. Donor: The late Mrs. Hume Wrong. Endowed 1962.

YTV Canada Inc. Youth and Television Award

Value \$1000. Awarded annually to a Fourth-year Honours student enrolled in the Mass Communication program whose thesis topic is related to youth and television. The recipient will be determined by a panel selected by the Associate Director (Mass Communication) of the School of Journalism and Communication. Donor: YTV Canada Inc. Established 1992.

Nathan and Sara Zelikovitz Award

Awarded to an outstanding undergraduate student registered in a full-time program at Carleton University. Donor: Nathan Zelikovitz. Endowed 1979.

Bursaries

African Students' Association Bursary

Awarded to a student in need of financial assistance who is a member of the African Students' Association and who is in good academic standing. Endowed in 1997 by the Carleton University African Students' Association.

Evelyn Aldridge Bursary in Economics

Awarded annually to a deserving and needy student or students in any year of B.A. or Honours studies in the Department of Economics at Carleton University. Endowed in 1980 in honour of Evelyn Aldridge, Department Secretary and Administrator, in recognition of 20 years of devoted service to the University and to the Department of Economics, its faculty and students. Donors: Members and graduates of the Department of Economics and friends of Mrs. Aldridge.

A. Andras Memorial Bursary

Awarded annually to an undergraduate student attending Carleton University who is in need of financial assistance and whose parent is a member of a trade union that is affiliated to the Canadian Labor Congress. Endowed 1972, in memory of the late Mr. A. Andras who was a member of Carleton's Board of Governors.

Milly Armour Memorial Bursary in Chemistry

Awarded annually to a deserving student proceeding from one year to another in the Major or Honours program in Chemistry who is in need of financial assistance. Endowed in 1993 by family and friends of Milly Armour who was a librarian at Carleton for many years.

Athletics Student Bursary

Awarded annually to returning undergraduate or graduate students who are in need of financial assistance and who are involved in inter-university sports. Endowed 1997.

Atkinson Charitable Foundation Bursary Fund

Awarded annually to undergraduate students who are residents of Ontario and who are in need of financial assistance. Donor: The Atkinson Charitable Foundation. Endowed 1997.

Bank of Montreal Bursaries

Awarded annually to deserving students who require financial assistance in order to attend, or continue their studies, at Carleton University. Preference is given to students who are studying within disciplines which are most relevant to the high technology industry, including computer and systems engineering, electrical engineering, and computer science. Donor: Bank of Montreal. Endowed 1997.

F. Luella Barrigar Bursaries

Awarded annually to students entering Carleton University or proceeding from one year of program to another who are in financial need. Some preference shall be given to students with an interest in

music. The bursaries are provided through the bequest of the late Miss F. Luella Barrigar, a teacher of music at the Ottawa Teachers' College. Donor: The late F. Luella Barrigar. Endowed 1981.

Nurse "Bill" Bayley Memorial Fund

The fund is to provide for assistance in emergencies for students requiring dental and medical care. Endowed in 1974 by friends and students, this award is named in honour of the late Kathleen Bayley, a member of the Counselling and Health Services from 1965 to the time of her death June 7, 1973.

R.A. Beamish Bursary

Awarded annually to a student entering or progressing from one year to another who, without financial assistance, could not continue his or her formal education. To be eligible, an applicant must be a resident of one of the 11 eastern counties of Ontario (Renfrew, Frontenac, Lanark, Leeds, Carleton, Grenville, Russell, Dundas, Prescott, Glengarry, Stormont). Donor: The R.A. Beamish Foundation. Endowed 1951.

Euphemia Bell Bursary Fund

To provide bursaries to deserving students in financial need. The fund has been made possible by a bequest of the late Euphemia Bell. Endowed 1978.

Bell Canada/Ottawa Senators Bursary

Awarded annually to a student who is in the Second year of an Engineering or Science program and who is in need of financial assistance. Donor: Proceeds from the annual Bell Canada/Ottawa Senators charity golf tournament. Endowed 1997.

David K. Bernhardt Award in Psychology

Awarded annually to Third or Fourth year undergraduate students who are registered in a program in the Department of Psychology and who are in need of financial assistance. Endowed in 1997 by David K. Bernhardt, a member of the Department of Psychology from 1964 to 1996.

Beta Sigma Phi Sorority Bursary

Value \$800. Awarded to a deserving full-time student or students in good standing requiring financial assistance to complete his or her studies. Preference will be given to a member of Beta Sigma Phi in good standing or the son or daughter of same. Donor: The City Council of Beta Sigma Phi Sorority. Established 1964. Revised 1981, 1985.

J.P. Bickell Foundation Bursary Fund

The Trustees of the J.P. Bickell Foundation have established bursaries in the Faculty of Science. An applicant must be taking a normal sequence of courses leading to a degree in Geology and must have competent academic standing. Carleton students may obtain full details of the bursary from the Awards Office. Donor: J.P. Bickell Foundation; Trustees: National Trust. Established 1956.

Robert Binney Memorial Award

Awarded annually to a student with good academic standing who is in the Third year of a program in the School for Studies in Art and Culture and who is in need of financial assistance. Endowed in 1997 by his parents in memory of Robert Binney, a 1991 Carleton graduate.

Birks Family Foundation Bursaries

The Birks Family Foundation has established a plan of annual contributions to the student aid fund of recognized Canadian universities and colleges for the creation of the Birks Family Foundation Bursaries. The bursaries are awarded by the foundation on the recommendation of the University Scholarship Committee and are not restricted to faculty or year and may be renewed. The number and amount of such awards may vary annually, depending upon the funds available for the purpose from the Foundation.

Warren Blackwood Memorial Bursary

Awarded annually to a full-time student proceeding from one year

to another in a Bachelor of Arts program. The bursary is awarded to a worthy student who is in need of financial assistance. Endowed in 1996 in memory of Warren Blackwood, a Carleton undergraduate student.

Elissa Gail Bonder Bursary in Journalism

Awarded in alternate years to a deserving student, from a high school in the Regional Municipality of Ottawa-Carleton, who is in the First year of the Journalism program and is in need of financial assistance. Established in 1995 by Linda and Ted in memory of his daughter Elissa Gail Bonder who graduated posthumously from Lisgar Collegiate Institute in 1991.

Nathan Braham Bursary

Awarded annually to an entering or returning student with superior academic standing who is in need of financial assistance. The bursary has been made possible by a bequest of Mr. Nathan Braham. Endowed 1964.

Donald William Buchanan Bursary

Awarded annually to a student entering or progressing from one year to another and who is in need of and deserving of assistance to continue studies as a full-time student. Donor: The late Donald William Buchanan. Endowed 1967.

Giovanni Caboto Award

Awarded annually to students studying Italian or students of Italian descent who are in good academic standing and in need of financial assistance. Endowed in 1997 by the National Congress of Italian Canadians Foundation (Eastern Ontario and Outaouais District) which is associated with The National Congress of Italian Canadians (National Capital District) to encourage and assist students and to commemorate the 500th anniversary of Giovanni Caboto's landing on Canadian soil.

C.A.M.P.S. Bursary

The fund is designed to provide assistance to mature or part-time students who are in financial need. Endowed in 1992 by the Carleton Association of Mature and Part-Time Students (C.A.M.P.S.) to commemorate its 10th anniversary.

Canadian Society for Mechanical Engineering/Marc Arnold Bursary

Awarded annually to a deserving student who is proceeding from Third to Fourth year of the Mechanical Engineering program who is in need of financial assistance. Endowed in 1997 by The Canadian Society for Mechanical Engineering and Chris Arnold in honour of his son Marc who is a graduate of Carleton University's Mechanical Engineering program.

Carleton University Academic Staff Association Bursaries

Awarded annually to full-time students who are residents of Ontario and who are in need of financial assistance. Donor: Carleton University Academic Staff Association. Endowed 1997.

C.U.A.S.A. Business Agent's Bursary

Awarded annually to a full-time student who is proceeding from one year of program to another, and is in need of financial assistance in order to continue his or her studies at Carleton. Endowed in 1988 by Patricia Ann Finn.

Carleton University Alumni Association Bursary Fund

Awarded annually to deserving students who require financial assistance in order to attend, or continue studies at, Carleton University. Donors: Carleton University alumni. Initiated by the National Alumni Council. Endowed 1996.

Carleton University Basketball Student Bursary

Awarded annually to returning undergraduate and graduate students who are in need of financial assistance and who are involved in inter-university basketball. Endowed 1997.

Carleton University Faculty Wives Association Bursary

Awarded to students in good academic standing and in financial need. Donor: Carleton University Faculty Wives Association. Established 1977. Endowed 1979. Revised 1988.

Carleton University Refugee Student Bursary

Value \$3,000. Awarded annually on the recommendation of the World University Service of Canada to a refugee student entering or continuing his or her program at Carleton University, who is in need of financial assistance.

Bower Carty Bursaries

Awarded annually to deserving students who require financial assistance in order to attend, or continue their studies, at Carleton University. Donor: Bower Carty. Endowed 1997.

Desmond Geoffrey Carty Bursary

Awarded annually to a student in course, specifically in Engineering, who would not otherwise be able to proceed without delay to a higher year within the University. Donor: Mrs. E.G. Carty, in memory of her son, Desmond Geoffrey Carty. Endowed 1983.

Edward Godfrey Carty Bursary

Awarded annually to a student in course, specifically in Engineering, who would not otherwise be able to proceed without delay to a higher year within the University. Donor: Mrs. E.G. Carty, in memory of her husband, Edward Godfrey Carty. Endowed 1964.

Maurice Frederick Carty Bursary

Awarded annually to a student in course who would not otherwise be able to proceed without delay to a higher year within the University. Donor: Mrs. E.G. Carty, in memory of her son, Maurice Frederick Carty. Endowed 1957.

CCRRIMS Bursary

Awarded annually to deserving full-time students enrolled in the Third year of the Bachelor of Commerce program who are following the Concentration in Finance and are in need of financial assistance. Endowed in 1997 by the Canadian Capital Region Risk and Insurance Management Society (CCRRIMS).

Centre for Initiatives in Education Bursary

Awarded annually to students in the Enriched Support Program who are in need of financial assistance. Endowed in 1997 by friends, faculty and staff of the Centre for Initiatives in Education.

Guze and Ganna Cini Bursary

Awarded annually to deserving students who are in need of financial assistance in order to attend or complete their studies. Donor: Mr. Carmel Cini in honour of his parents Guze and Ganna Cini. Endowed 1998.

The Fred Cinkant Bursaries in Engineering

Awarded annually to Canadian citizen students entering or proceeding from one year of program to another in the Faculty of Engineering, who are in need and deserving of financial assistance to continue their studies at Carleton. Donor: Fred Cinkant, in memory of his mother and father, Mr. and Mrs. Antal Cinkant. Endowed 1984.

The Lorraine Cinkant Bursaries in Science

Awarded annually to Canadian citizen students entering or proceeding from one year of program to another in the Faculty of Science, who are in need and deserving of financial assistance to continue their studies at Carleton. Donor: Lorraine Cinkant, in memory of her mother and father, Mr. and Mrs. Edmond Sabourin. Endowed 1984.

Steve Coughlin Memorial Bursary

Awarded annually to deserving students requiring financial assistance, who are in the Second, Third or Fourth year of an undergraduate program. Endowed in 1990 by friends and family in memory of Steve Coughlin B.A. 1989.

The Harold Crabtree Foundation Award Fund

Awarded annually to outstanding entering or returning undergraduate students in the Faculty of Arts and Social Sciences who are in need of financial assistance. Donor: The Foundation was founded in 1951 in Montreal by Harold Crabtree to address his charitable giving interests in education and health. Endowed 1997.

David Currie Memorial Bursary

Value \$2,500. Awarded annually to a full-time student enrolled in the Second year of a program, who is from the Regional Municipality of Ottawa-Carleton and is in need of financial assistance. The bursary may be held until graduation, at which time a new award will be made. Donor: Royal Canadian Legion, Ottawa Branch 16. Established 1990 in memory of Lieutenant Colonel David Currie, V.C., who was a member of Ottawa Branch 16 and a Canadian who served his country well in war and peace.

Disabled Student Bursary Fund

The fund is to provide for disabled students in need of financial assistance. Donor: Joy MacLaren. Endowed 1988.

Alexander Dayton Bursary

Awarded annually to undergraduate students at Carleton University who are in need of financial assistance. Endowed 1997 by a bequest from the estate of Alexander Dayton.

Gerhard Dittmann Bursary

Awarded annually to students in financial need who are entering or proceeding from one year to another of an undergraduate program. The bursary has been made possible by a bequest of the late Gerhard Dittmann, a long time employee of Carleton University. Endowed 1990.

Claude A. Edwards Bursary

Awarded annually to deserving full-time mature students who are in need of financial assistance to continue their studies. Established in 1996 by Claude A. Edwards, former Chair of the Board of Governors.

Faculty of Engineering Bursary

Awarded annually to undergraduate students in the Faculty of Engineering who are in need of financial assistance. Endowed in 1997 by faculty and staff of the Faculty of Engineering.

Engineers' Wives Association Bursary

Awarded annually to deserving students enrolled in the Faculty of Engineering. Donor: Engineers' Wives Association of Ottawa. Established 1959. Revised 1987.

Department of Environmental Science Bursary

Awarded annually to a deserving student enrolled in the Environmental Science program who requires financial assistance in order to attend, or continue studies at, Carleton University. Donor: Dr. Donald Wiles. Endowed 1997.

Lillian Fallis Bursary

Awarded annually to a deserving student(s) proceeding from one year of program to another in the School of Business at Carleton University and who is in need of financial assistance. Donors: The family of the late Duncan H. Maclaren, a graduate of the School of Business. Endowed in 1980 in honour of Mrs. Lil Fallis, a long-time member of staff in the school, in recognition of her special interest in and support of students.

The Muriel Foulger Art History Travel Bursary

Awarded annually, on the recommendation of the Art History program co-ordinator, to deserving students in the Art History program who require financial assistance in order to meet travel or accommodation costs associated with optional study trips undertaken with the approval of the authorities responsible for the Art History program. Donors: Family and friends of the late Muriel Foulger, a long-time staff member and graduate of the University, in honour of her love of art and travel. Endowed 1992.

Bill Fraser Memorial Bursary

Awarded annually to a deserving student entering or enrolled in a French program who is in need of financial assistance in order to attend, or continue studies at, Carleton University. Donors: Colleagues and friends in memory of Bill Fraser who was a faculty member within the Department of French from 1966 to 1995. Endowed 1995.

Friends of Carleton Bursary Fund

A sum to provide bursaries for deserving students in need of financial assistance. This fund has been made possible by contributions from the Friends of Carleton University. Established 1967.

The Douglas Fullerton Award in Urban Studies

Awarded annually, when merited, to a student engaged in research leading to an honours thesis or project in the field of urban studies. The fund has been established to assist students who are in need of financial assistance to undertake study of the urban area, particularly as it relates to the quality of urban life. Recipients will be chosen by the Chair of the Department of Geography and Environmental Studies on the recommendation of a selection committee of faculty members. Endowed in 1997 by friends, colleagues and family of the late Douglas Fullerton, former Chairman of the National Capital Commission, in recognition of his visionary contributions to city life.

Henri and Jacques Gervais Memorial Fund

Bursaries are awarded annually to deserving undergraduate students in need of financial assistance to continue their studies at Carleton University. Endowed in 1996 by Claire Gervais in loving memory of her husband, Henri N. Gervais, and her son, Jacques N. Gervais.

Mary C. Grant Bursary (Laurentian Chapter, I.O.D.E.)

Value \$1,125. Awarded annually to not more than three students who require financial assistance. The bursary was endowed in honour of Mary C. Grant. Donor: The Laurentian Chapter, I.O.D.E. Established 1962. Revised 1980.

Great-West Life Assurance Company Award in Business

Awarded annually to deserving students enrolled in the Fourth year of the Bachelor of Commerce program who are following the marketing concentration and are in need of financial assistance. Endowed in 1997 by the Great-West Life Assurance Company.

Shirley Greenberg Award

Value \$500. Awarded annually to a deserving student who is a sole-support parent and who is in need of financial assistance. Donor: Canadian Federation of University Women/Ottawa. Established 1993. Revised 1996.

Heather and Ross Hamlin Bursaries

Awarded annually to deserving students who require financial assistance in order to attend, or continue their studies, at Carleton University. Donor: Heather and Ross Hamlin. Endowed 1997.

Alison Hardy Memorial Bursary

Awarded annually to a deserving student in the Third or Fourth year of the Journalism program who requires financial assistance to complete the program. Established in 1993 by the National Council of Women of Canada in memory of Alison Hardy who was an active member of the Council for many years.

Hobbs/Weber Bursary in Business

Awarded annually to a full-time student in financial need, who has good academic standing and is in the Third or Fourth year of the Bachelor of Commerce or Bachelor of International Business program. This award was established by the Faculty and Staff of the School of Business in recognition of the contributions of Professors Clement Hobbs and Wesley Weber to the academic life and development of the School of Business. Endowed 1996.

C.T. Hobin Bursaries

Awarded annually to deserving Ontario students in financial need who are in good academic standing and are in the Third or Fourth year of the Bachelor of Architecture or the Bachelor of Humanities programs. Donor: Barry J. Hobin, B.Arch 1974, son of Mr. C. T. Hobin. Endowed 1997.

International Student Bursary Fund

The fund is to provide for foreign students in good academic standing who are enrolled in a full-time undergraduate program and in need of financial assistance. Donor: Anonymous. Endowed 1989.

Bill and June Joe Bursary

Awarded annually to deserving students from the Regional Municipality of Ottawa-Carleton who require financial assistance in order to attend, or continue studies at, Carleton University. Donor: Bill and June Joe. Endowed 1997.

Grace and Ken Johnston Bursary

Awarded annually to two full-time students in the Third or Fourth year of the History program who are in need of financial assistance. Donors: The Ottawa City Union of the International Order of the King's Daughters and Sons. Endowed in 1991 in honour of Ken Johnston and his wife the late Grace Johnston.

Dr. Roger Kaye Memorial Award

Awarded annually to a deserving student enrolled in the Faculty of Engineering who is a resident of Ontario and who is in need of financial assistance to continue studies at Carleton University. Donors: Colleagues, family and friends in memory and honour of Dr. Roger Kaye, who was a Professor of Systems and Computer Engineering. Endowed 1997.

John Lyndhurst Kingston Bursary Fund

The fund is to provide assistance to needy students in the study of architecture. This fund has been made possible by a bequest of the late Leslie Chandler Kingston. Endowed 1986

Knights of Pythias, Aurora Lodge No. 53 Bursary

Value \$150. Awarded to a good student progressing from one year of program to another who needs financial assistance to continue his or her studies. Donor: Knights of Pythias, Aurora Lodge No. 53. Established 1960.

Terry Lamb Memorial Award

Awarded annually to a deserving student who is in the Fourth year of the Civil Engineering program and who is in need of financial assistance. Donors: Friends, family and associates in memory and honour of the late Terry Lamb, P.Eng., who graduated from Carleton University's Civil Engineering program in 1979. Endowed 1997.

Patricia Larmonth Memorial Bursary

Value \$400. Awarded on the basis of reasonable competence, need and personal qualifications to a Canadian citizen who is a full-time student. Donor: Ottawa Women's Canadian Club. Established 1971. Revised 1983.

Jean A. Loates Bursary

Awarded annually to a deserving student entering Carleton University or proceeding from one year of program to another and requiring financial assistance to complete his or her studies. Donated by friends and colleagues of Jean Loates to mark her retirement in 1977. Mrs. Loates is a Carleton graduate and had a 26-year career at the University, first as Student Personnel Officer and from 1966 as Awards Officer. Endowed 1977.

J. Graham MacDonald Memorial Bursary

Awarded annually to one or more deserving students in financial need and proceeding from one year to the next in an undergraduate Geology program. Endowed in 1995 by the family of J. Graham MacDonald.

Joe MacDonald Memorial Bursary

Awarded to a full-time student in an arts or social sciences program who is in need of financial assistance and who was admitted to the University from a secondary school in Sudbury, Ontario. Established by funds donated in memory of Constable Joe MacDonald, a 1988 Carleton graduate and four-year member of the Ravens football team. Endowed 1993.

Paul Mandl Bursary Fund

Awarded annually to deserving students in the Honours Mathematics program who are in need of financial assistance. Endowed in 1997 by Dr. Paul Mandl, retired member of the Department of Mathematics and Statistics, and his colleagues.

Manulife Financial Bachelor of International Business Bursaries

Awarded annually to deserving students enrolled in Third year of the Bachelor of International Business Honours program who require assistance to study abroad. Donor: Manulife Financial (The Manufacturers Life Insurance Company). Established 1997.

Marriott Bursary

Awarded annually to deserving students enrolled in the Third year of the Bachelor of International Business Honours degree program who require assistance to study abroad. This fund was endowed in 1996 by Marriott Corporation of Canada, Ltd. to commemorate 30 years of partnership with Carleton University.

Dawna McLaughlin Bursary

Value \$1,500. Awarded annually to a deserving full-time student in the Third or Fourth year of a program and who is in need of financial assistance. Donor: Dawna McLaughlin, B.A. 1978. Established 1998.

Department of Mechanical and Aerospace Engineering Bursary

Awarded annually to a deserving undergraduate student who is entering Mechanical and Aerospace Engineering and who is in need of financial assistance. Endowed in 1997 by members of the Department of Mechanical and Aerospace Engineering.

Paul Menton Memorial Bursary

Awarded annually to a physically disabled student, in good academic standing, who is proceeding from one year to another of an undergraduate program and is in need of financial assistance. Endowed 1990 by family and friends in memory of Paul Menton, Carleton University's first co-ordinator of disabled programs.

The Métis Awards

Established by The Métis Nation of Ontario through the Métis Training Initiatives and awarded on the basis of financial need to Métis students registered in any year in any faculty or school at Carleton University. Selection for the awards will be made in consultation with the Métis Nation of Ontario. Endowed 1997.

Nepean Kiwanis Bursary

Value \$1,000. First awarded in 1969-70 to an undergraduate student in any year or faculty with good academic standing and in need of financial assistance. Donor: Kiwanis Club of Nepean. Established 1969 in memory of the late Gretta Boyd. Revised 1885, 1994, 1998.

The New Sun New Beginnings Bursary Fund

Awarded annually to full-time and part-time students who have demonstrated a commitment to furthering their education and who are in financial need. Preference will be given to students in the Centre for Initiatives in Education Enriched Support Program, mature students and Aboriginal students. Endowed in 1997 by Mrs. Joy Maclaren, who was given the name "New Sun" at an Aboriginal Peoples' naming ceremony. Mrs. Maclaren, a former member of the University's Board of Governors, established the award in recognition of Carleton's role in providing accessible education.

Ottawa Citizens' War Services Committee Bursary

An annual sum of approximately \$300 is available to assist veterans, their dependents or descendants, who are students in good standing at Carleton University and are in need of financial assistance. Endowed 1948.

Ottawa Superfluity Shop Bursaries

An annual sum of approximately \$1,500 is available to provide bursaries for veterans of World War I or World War II, or for the descendants of such veterans, who are students in good standing at Carleton University and in need of financial assistance. Endowed 1947.

Agnes J. Godard and Hector H. Perrier Memorial Fund

Bursaries are awarded annually to deserving students in need of financial assistance to continue their studies in the Bachelor of

Humanities program. Endowed in 1995 by Bernard L. Perrier in memory of his parents.

Phillips Bursary

The annual yield of a fund of \$5,000 made available to Carleton University by Miss L.A. Phillips. The bursary is to be awarded each year to a student with good academic standing who is in need of financial assistance. Endowed 1962.

Edward T. Pryor Bursary Fund

Awarded annually to one or more deserving students in the Sociology program who are in need of financial assistance. The fund has been made possible by contributions from friends and family in memory of Edward T. Pryor to honour his commitment to social science, scholarship and the youth of Canada. Endowed 1993.

Alois Raffler Bursary

Awarded annually to deserving students within the Faculty of Science who are residents of Ontario and require financial assistance in order to attend, or continue their studies at, Carleton University. Preference is to be given to students entering First year. Donors: Friends and colleagues of Alois Raffler in honour of Mr. Raffler on the occasion of his retirement as Director of the Science Technology Centre. Endowed 1997.

Frank Ratcliffe Memorial Bursary

Awarded annually to a full-time student in the Second, Third or Fourth year of the Bachelor of Journalism program. The bursary is awarded to a worthy student who is in need of financial assistance. Endowed in 1996 by the Canadian Olympic Association in memory of Frank Ratcliffe, the Association's former Director of Communication.

James H. Ratray Bursary Fund

To provide bursaries for students in Science and Engineering, with certain areas of preference. Donor: The late James H. Ratray, M.C. Endowed 1961.

J. Lansing Rudd Bursary

Awarded annually to a good student progressing from one year of program to another who needs financial assistance to continue his or her studies. Donor: The late J. Lansing Rudd. Endowed 1967.

John E. Ruddy Bursary Fund

Awarded annually to deserving full-time students enrolled in the Fourth or Fifth year of the Bachelor of Architecture program and to Carleton University varsity team athletes. Students must be in need of financial assistance and in good academic standing. Endowed in 1997 by John E. Ruddy, B.Arch. 1975, who was a varsity athlete during his years at Carleton.

School for Studies in Art and Culture Bursary

Awarded annually to students in the School of Art and Culture who are in need of financial assistance. Endowed in 1997 by faculty and staff of the school.

Reece Scofield Memorial Bursary

Awarded annually to a student in the Criminology program who is in need of financial assistance. Endowed in 1997 in memory of Reece Scofield by his family, friends and fraternity brothers of the Sigma Pi Fraternity.

Abraham and Mary Shaffer Bursary

Awarded annually to a good student entering Carleton University or proceeding from one year of program to another and requiring financial assistance to complete his or her studies. Donor: The late Abraham Shaffer. Endowed 1967.

Sprott Charitable Foundation Bursary Fund

Awarded annually to deserving undergraduate students who are in need of financial assistance to complete their program. Donor: Eric S. Sprott, B.Comm., 1965. Endowed 1997.

Z. Matthew Stankiewicz Bursary

Awarded annually to a deserving student requiring financial assistance, who is entering or is enrolled in the School of Architecture at Carleton University. Donors: Friends, relatives and associates of the late Z. Matthew Stankiewicz. Endowed 1980.

The William John Stauffer Memorial Bursary in Electrical Engineering

Awarded annually to a student who is proceeding from Second to Third year in the Electrical Engineering program and who is in need of financial assistance. Endowed in 1990 by family and friends in memory of William John Stauffer who had an avid interest in electrical engineering.

Ormond M. Stitt Bursary Fund

To provide bursaries for deserving students in need of financial assistance. The fund has been made possible by a bequest of the late Miss Edith May Stitt, in memory of her brother, Ormond M. Stitt. Endowed 1966.

Taggart Bursary Fund

Awarded annually to students proceeding from one year of program to another in Engineering who are in good academic standing and require financial assistance. Donor: The Taggart Group of Companies. Endowed 1997.

Isabella Ellen Taylor Memorial Bursary Fund

To provide bursaries to undergraduates in any year of program who are in need of financial assistance and have good academic standing. Donor: The late Daisy Elizabeth Taylor. Endowed 1969.

The M.A. Teall Foundation Bursaries

Awarded annually to deserving students who require financial assistance in order to attend, or continue studies at, Carleton University. Donor: The M. A. Teall Foundation. Endowed 1997.

C.R. Thompson Bursary

Value to be announced. Awarded annually to a deserving student proceeding from one year of program to another in the Faculty of Engineering who is in need of financial assistance. Endowed in 1980 in honour of C.R. Thompson, Associate Dean of Engineering in recognition of his contributions to the Faculty of Engineering and its students.

The Michael Timonin Bursary in Biology

Awarded annually to deserving students, entering or proceeding from one year of course to another in the Major or Honours program in Biology and who are in need of financial assistance to continue studies at Carleton University. Endowed in 1990 by family and friends of Michael Timonin in honour of his 90th birthday.

Angela Tong Memorial Award

Awarded annually to a student with good academic standing who is in the Fourth year of the Honours program of the School of Linguistics and Applied Language Studies and who is in need of financial assistance. Endowed in 1997 in memory of Angela Tong by family, friends and the faculty of the School of Linguistics and Applied Language Studies.

Toronto-Dominion Higher Education Bursary

Awarded annually to deserving undergraduate students who are in need of financial assistance to complete their program. Donor: The Toronto-Dominion Bank. Endowed 1997.

Hubert Travers Bursary

Awarded annually to students in financial need who are entering or proceeding from one year to another of a full-time undergraduate program at Carleton University. Preference shall be given to students from the Ottawa area. Endowed 1983.

Trivial Pursuit Bursary

Awarded annually to deserving students in the Second, Third or Fourth year of the Journalism program who require assistance to complete their studies. Endowed in 1988 by the shareholders of Horn Abbot Ltd. in recognition of the perseverance, generosity and success of the creators of Trivial Pursuit and the Directors of Horn Abbot Ltd.

University General Bursary Fund

The fund is to provide bursaries in aid of students with satisfactory academic standing who, in the First or subsequent program years, are in need of financial assistance. Established by the University in 1954.

John Gordon Urquhart Memorial Bursary

Awarded annually to a deserving student proceeding from one year to another of the Commerce program who is in need of financial assistance. Endowed 1994 by the family in memory of John Gordon Urquhart, B.A. 1949.

Zeev and Sara Vered Bursary Fund

Awarded annually to students proceeding from one year to another of a program who are in good academic standing and who require financial assistance. Endowed in 1997 by Sara Vered, B.A. 1978 and Zeev Vered who was a member of the Carleton University Board of Governors from 1987 to 1998.

Wainwright Bursary

Awarded annually to a student or students studying Canadian history. Donor: Miss Dora I.I.S. Wainwright. Endowed 1974. Revised 1980.

Ann E. Whitmore Bursary

Value \$500. Awarded annually to a deserving student in the Geology program who requires financial assistance. The bursary has been made possible by a bequest from the estate of Ann E. Whitmore. Endowed 1994.

Geoff Wightman Award in Chemistry

Awarded annually, when merited, to an outstanding full-time student in the Honours Chemistry program or Biochemistry program who has completed the Introductory Organic Chemistry course and is in need of financial assistance. Endowed in 1997 by Dr. and Mrs. R.H. Wightman in memory of their son.

Honourable Cairine Wilson Bursary

Awarded annually to a good student entering Carleton University or proceeding from one year of program to another and requiring financial assistance to complete his or her studies. The bursary has been made possible by a bequest of The Honourable Cairine Wilson, first woman member of the Canadian Senate. Endowed 1962.

Loan Funds*John Parker Loan Fund*

To provide loans of up to \$1,000 to students in their first year of studies at Carleton and up to \$1,500 in future years to students who require financial assistance to meet their educational costs. This fund also provides emergency loans for 60 days or less to students whose funds from other sources have been delayed. Application forms are available to students in the Awards Office.

Government Aid programs:

See Student Services p. 22.)

Further information regarding existing sources of scholarships, awards, bursaries and loans may be obtained from the Awards Office, telephone 520-3600.

Carleton Through the Years

The Institution

1942

The Ottawa Association for the Advancement of Learning was established to develop Carleton College. The College offered only evening classes in introductory university subjects, with some courses in public administration.

1943

The Ottawa Association for the Advancement of Learning was incorporated and the Institute for Public Administration was established.

1945

Beginning of day classes and full-time teaching in arts, science, journalism, and first-year engineering. Establishment of the Faculty of Arts and Science.

1946

Move from rented premises to First Avenue campus, formerly Ottawa Ladies' College. First degrees awarded in journalism and public administration.

1947

The College committed itself to develop pass and four-year honours programs.

1949

First undergraduate pass degrees in arts, science, and commerce awarded. Formation of Senate.

1950

First honours degrees in arts and science awarded.

1952

The Carleton College Act, 1952 passed by the Ontario Legislature. This changed the corporate name to Carleton College and confirmed the power to grant degrees. Property for Rideau River campus acquired.

1953

Establishment of the School of Public Administration.

1954

Appointment of Architectural Associates for Carleton to prepare a master plan for Rideau River campus, and to design the first group of buildings. First honorary degree (LL.D.) conferred on Dag Hammarskjöld, Secretary-General of the United Nations.

1955

First Master of Arts degree awarded.

1957

The Carleton University Act, 1957. Establishment of the School of Engineering. Establishment of the Institute of Canadian Studies.

1958

First Master of Science degree awarded.

1959

Move to Rideau River campus, following construction of the Henry Marshall Tory Building (science), the Maxwell MacOdrum Library, and Norman Paterson Hall (arts).

1961

First Ph.D. degree in science awarded. First degrees in engineering awarded.

1962

Southam Hall, the University Commons, Renfrew House and Lanark House (residences) completed. Norman Paterson Hall extended, and University Union opened.

1963

First Master of Engineering degree awarded. Reorganization into the Faculties of Arts, Engineering, Science, and Graduate Studies and Research.

1964

The C.J. Mackenzie Building (engineering) completed.

1965

The E.W.R. Steacie Building (chemistry), Grenville House and Russell House (residences), Maintenance Building, and Heating Plant completed.

1966

First Ph.D. degree in engineering awarded. The Physics Building completed (designated in 1972 as the Herzberg Laboratories for Physics). Establishment of the Schools of International Affairs and Commerce.

1967

Loeb Building (social sciences) completed. Integration of St. Patrick's College as a division of the Faculty of Arts. Integration of the School of Social Work.

1968

First Ph.D. degree in arts awarded. First Master of Social Work degree awarded. Establishment of the School of Architecture.

1969

Controlled Environmental Facility (biology), Administration Building, Glengarry House (residence), and University Commons (residence cafeteria) completed.

1970

University Centre and Parking Garage completed.

1971

Arts Tower completed.

1972

Architecture Building completed. School of Social Work accommodated on the Rideau River campus.

1973

St. Patrick's College moves to new facility on the Rideau River campus. First degrees in architecture awarded. New athletic complex containing 50-metre pool and fitness centre opened. School of Industrial Design established.

1974

Faculty of Graduate Studies and Research expanded into the Faculty of Graduate Studies and Research. School of International Affairs renamed the Norman Paterson School of International Affairs. Master of Journalism program approved for September 1974. Master of Arts programs in anthropology and in religion approved for September 1975. Program leading to Certificate in the Teaching of English as a Second Language established.

1975

Lester B. Pearson Chair for International Affairs approved for January 1, 1975. Establishment of Gerhard Herzberg Lecture Series in Science.

1976

First Dunton Alumni Award presented, January 1976. Creation of the Paterson Centre for International Programs in March 1976. Division of the Faculty of Arts into two separate faculties: the Faculty of Arts and the Faculty of Social Sciences, effective July 1976. First Master of Journalism degrees awarded, November 1976.

1977

Opening of the Criminology and Corrections concentration at St. Patrick's College, April 1977.

1978

School of Continuing Education established. Credit courses offered on cable television for the first time. Institute of Biochemistry established.

1979

St. Patrick's College ceased to operate as an academic unit of the University. Academic programs of the college continue as University programs, except for the Unified Liberal Arts Program.

1980

Establishment of the School of Computer Science. Establishment of the Chair of Office Automation in the Faculty of Engineering.

1981

Establishment of the Ottawa-Carleton Institute for Graduate Studies and Research in Chemistry, a joint program with the University of Ottawa. Establishment of a joint Ph.D. program in economics with the University of Ottawa.

1982

Establishment of the Ottawa-Carleton Centre for Geoscience Studies, representing the combined research strengths of Carleton University and the University of Ottawa, with programs leading to M.Sc. and Ph.D. degrees in most areas of geology. Establishment of a joint master's program in computer science with the University of Ottawa.

1983

Establishment of four joint graduate programs with the University of Ottawa: the Ottawa-Carleton Centre for Graduate Studies and Research in Biology; the Ottawa-Carleton Centre for Graduate Studies and Research in Physics; the Ottawa-Carleton Institute for Graduate Studies and Research in Electrical Engineering; and the Ottawa-Carleton Graduate Specialization in Neuroscience.

1984

Establishment of three joint graduate programs with the University of Ottawa in the areas of civil engineering, mechanical and aeronautical engineering, and mathematics and statistics.

1985

Master of Management Studies program established in the School of Business. The School of Public Administration offers a concentration in development administration in conjunction with the Norman Paterson School of International Affairs. An additional floor on one wing of the Herzberg Laboratories for Physics is constructed to house the School of Computer Science.

1986

The Social Sciences Research Building, the first new building on campus in a decade, is built to accommodate the rapidly-expanding research activity in the Faculty of Social Sciences. Construction of an annex on top of the Architecture Building to provide additional space for the Faculty of Engineering.

1987

The Institute of Women's Studies is established. The Arts Tower is renamed Davidson Dunton Tower/ Edifice Davidson Dunton in honour of Arnold Davidson Dunton, former Carleton University President and Director of the Institute of Canadian Studies. Major revisions to the Undergraduate Exchange Agreement with the University of Ottawa extend opportunities for students to study at both universities. The University launches the Carleton University Challenge Fund, the largest fund-raising campaign in its history.

1988

Canada's first full Bachelor of Engineering program in Aerospace Engineering is established. Bell-Northern Research Limited and

the Natural Sciences and Engineering Research Council provide funding for an Industrial Research Chair in Computer-Aided Engineering within the Department of Electronics. The Departments of Electronics and Systems and Computer Engineering are major partners in the Telecommunications Research Institute of Ontario (TRIO), one of seven "centres of excellence" chosen by the provincial government for scientific research. The Faculty of Science introduces cooperative education programs in computer science and biochemistry/biotechnology.

1989

The University launches its first major program of construction and renovation in more than 20 years. Four capital projects are initiated: an addition to the MacOdrum Library; the Minto Centre for Advanced Studies in Engineering; a 400-bed residence building; and an addition to Southam Hall. A fifth project, the Life Sciences Research Building, is completed in 1989. The Institute of Political Economy is established. The Canadian Centre for Trade Policy and Law, a joint initiative of the Norman Paterson School of International Affairs at Carleton and the Faculty of Law at the University of Ottawa, is established.

1990

A new Ph.D. program in computer science, offered jointly with the University of Ottawa, is established. The University introduces a Bachelor of Social Work degree program. The Paul Menton Centre for Persons with Disabilities is opened. The Centre for Research in Particle Physics is established to carry on the work of the National Research Council's large-scale physics projects.

1991

Establishment of the Carleton University Development Corporation. \$11 million extension to the MacOdrum Library opened. The university's \$30 million Challenge Fund campaign surpassed its goal; \$1.5 million "enhancement" campaign announced. Registrarial services for arts and social sciences re-organized into two separate offices. Establishment of the Centre for Analytical and Environmental Chemistry. Establishment of the School of Comparative Literary Studies. Establishment of the School for Studies in Art and Culture (bringing together the Departments of Art History, Film Studies, and Music). Establishment of the international exchange agreement between Carleton University, four Swedish universities, and three other Canadian universities (Laval, York, and the University of British Columbia). Establishment of the Carleton University/Polish faculty exchange agreement. Establishment of the Chair for Management in Technological Change. Establishment of M.A. programs in political economy, communication, legal studies, and applied language studies. Establishment of the women's history field in the Ph.D. program in history. Establishment of the Ph.D. program in public policy in the School of Public Administration.

1992

The University celebrates its 50th anniversary. Institute for Interdisciplinary Studies, which includes a new B.A. program in environmental studies, is established. Department of Civil Engineering renamed Department of Civil and Environmental Engineering to reflect emphasis on the environment and new undergraduate program in environmental engineering. School of Journalism renamed School of Journalism and Communication, and Institute of Canadian Studies becomes School of Canadian Studies. The Centre for Aboriginal Education, Research and Culture is established. A new Ph.D. program in public policy, the first of its kind in Canada, is offered by the School of Public Administration, and a master's program in Canadian art history is introduced. The Carleton University Art Gallery and the Minto Centre for Advanced Studies in Engineering are opened. The Governor General of Canada and Head of the Canadian Heraldic Authority, His Excellency the Right Honourable Ramon John Hnatyshyn, grants the arms and flag of Carleton University at the fall convocation ceremonies.

1993

Centre for Memory Assessment and Research established. Teaching and Learning Resource Centre established. Institute of Soviet and East European Studies renamed Institute for Central/East European and Russian Area Studies. Carleton University hosts the 1993 Learned Societies Conference. Construction begins on new Inco Centre. Institute of Women's Studies renamed Pauline Jewett Institute of Women's Studies. Administration Building renamed Robertson Hall.

1994

New Industrial Research Chair in Performance Engineering of Real-Time Software established. The Inco Centre officially opened. Research Facility for Electron Microscopy opened. New Ph.D. program in Public Policy established. New Bachelor of International Business program approved. Colonel By Child Care opened. Construction begins on the new Carleton Technology and Training Centre.

1995

Carleton Technology and Training Centre opened. Bachelor of Humanities undergraduate degree program established. College of the Humanities approved.

1997

Two new faculties created: the Faculty of Arts and Social Sciences and the Faculty of Public Affairs and Management. Department of Religion joined the College of the Humanities. School of Architecture modified its program to create a four-year degree program, with the professional designation provided by the two-year master's program. Bachelor of Arts program improved with standardization of programs across all departments and introduction of programs to allow students to improve their academic skills and to "tailor" their degrees to specific goals. Physics undergraduate degree program replaced with an applied physics program. Several small language programs closed: German, Italian, Russian, Spanish) as well as undergraduate programs in Comparative Literary Studies and Classics. New undergraduate program in Communications Engineering established. Co-operative education programs offered in all engineering programs.

The following graduate programs were established: Ph.D. in Cognitive Science; Ph.D. in Communications; Master of Arts in Film Studies; Master of Public Administration (with a Concentration in Innovation, Science, and Technology Policy); and the Graduate Certificate in Conflict Resolution.

1998

Faculty of Science realigned its departments into the College of Natural Sciences and the School of Mathematics and Statistics. Centre for Initiatives in Education added to the Faculty of Arts and Social Sciences. Department of Geography renamed the Department of Geography and Environmental Studies.

Two new degree programs created: Bachelor of Mathematics and Bachelor of Public Affairs and Policy Management. Two new programs added to the Bachelor of Arts degree program: Art and Culture, and Criminology and Criminal Justice.

New programs established in Computational Chemistry, Engineering Physics and Software Engineering. Master of Science in Information and Systems Science (MScISS) program expanded.

School of Computer Science established a computer retraining certificate program. Office to coordinate co-op placements for engineering and science students opened.

Chancellors

1952 — 1954

Harry Stevenson Southam

1954 — 1968

Chalmers Jack Mackenzie

1969 — 1972

Lester Bowles Pearson

1973 — 1979

Gerhard Herzberg

1980 — 1990

Gordon Robertson (Emeritus 1992 -)

1990 — 1992

Pauline Jewett

1993 —

Arthur Kroeger

Presidents

1942 — 1947

Henry Marshall Tory

1947 — 1955

Murdoch Maxwell MacOdrum

1955 — 1956

James Alexander Gibson (acting)

1956 — 1958

Claude Thomas Bissell

1958 — 1972

Arnold Davidson Dunton

1972 — 1978

Michael Kelway Oliver

January 1 — May 15, 1979

James Downey (pro tempore)

1979 — 1989

William Edwin Beckel

1989 — 1996

Robin Hugh Farquhar

1996 —

Richard J. Van Loon

Public Lectures at Carleton University

Major Lecture Series

A distinguished series of lectures supported by Carleton University faculties.

The Florence Bird Lecture

This annual lecture was established in 1987 to explore the experiences of women in Canada and abroad. It is named in honour of the Honourable Florence Bird, in recognition of her work for the CBC, CIDA, the Royal Commission on the Status of Women in Canada, and the Senate. The lecture is sponsored jointly by the Faculty of Arts and Social Sciences.

The Davidson Dunton Research Lecture

Established in 1983, the Davidson Dunton Research Lecture is presented by a Carleton University scholar who is active in research and has achieved international recognition. The lecture is in honour of former Carleton University President Arnold Davidson Dunton.

The Gerhard Herzberg Lecture

Established in 1975 by the Faculty of Science, this lecture honours Gerhard Herzberg, a former Chancellor of Carleton University and recipient of the 1971 Nobel Prize for Chemistry. The purpose of the lecture is to emphasize the relationship between science and society and to address an aspect of science which has a pronounced impact on our daily lives.

The Marston LaFrance Research Fellowship Lecture

The fellowship was established in 1979 by the Faculty of Arts and Social Sciences in memory of Marston LaFrance, former Professor of English and Dean of Arts at Carleton University. Each year, the recipient presents a seminar or public lecture on some aspect of the research conducted while on the LaFrance fellowship.

The John Porter Memorial Lecture

This annual lecture is sponsored by the Faculty of Arts and Social Sciences in memory of John Porter, former Vice-President (Academic) at Carleton University and a distinguished sociologist. The series was established in 1982.

Special Lectures

Individual lectures sponsored by various academic departments or endowments.

The Munro Beattie Lecture

This lecture was established in 1985 in honour of Alexander Munro Beattie, the founder and first Chair of the Department of English, in recognition of his outstanding contribution to Carleton University in teaching, scholarship and administration. The series is sponsored by the Department of English.

The Dick and Ruth Bell Lecture

Established in 1988 in honour of the late Dick Bell and Ruth Bell. The lecture will be delivered annually by distinguished scholars in the field of political science or by distinguished persons serving or having served in the public life of Canada or one of its provinces. Supported through the Dick and Ruth Bell Fund.

The Edgar and Dorothy Davidson Lecture

The Edgar and Dorothy Davidson Lecture was established in 1983 and is sponsored by the College of the Humanities. The lecture brings a prominent scholar in the area of religious studies and related areas to speak at Carleton.

The McMartin Memorial Lecture

The McMartin Memorial Lecture is presented in alternate years by the College of the Humanities at Carleton University and the Faculty of Graduate Studies and Research at the University of Ottawa. The series was established in 1969 and is funded by Mrs. J.P. Gilhooly of Ottawa in memory of her parents, Mr. and Mrs. John McMartin. The lectures involve themes which promote the importance of ethical, moral, and religious standards to education and living.

The Adam Mickiewicz Memorial Lecture

Established in 1969, the Adam Mickiewicz Memorial Lecture is presented each year by noted authorities in the area of Soviet and East European Studies. The series is sponsored by Carleton University's Institute of Central/East European and Russian-Area Studies and the Adam Mickiewicz Foundation of Canada to commemorate Poland's foremost poet, Adam Mickiewicz.

The H.H.J. Nesbitt Lecture

This annual lecture series was established in 1987 by the Faculty of Science in honour of H.H.J. Nesbitt, Carleton University's first Dean of Science. The lectures are presented by Carleton alumni who have earned international recognition as scientists. The topics are of general interest to the public as well as the scientific community.

The Pickering Lecture

Established in 1975, the Pickering lecture topics focus on problems of developmental and childhood psychology. The Pickering Lecture is sponsored by the Department of Psychology.

The Technology, Society, Environment Studies Committee Lecture

Established in 1981 to sensitize the public to the impact of technology on society and the environment. The lecture is sponsored by the Technology, Society and Environment Studies Committee.

The Philip E. Uren Memorial Lecture

The Philip E. Uren Memorial Lecture is sponsored by the Dean of the Faculty of Public Affairs and Management in memory of Philip Uren, former Director of the Institute of Soviet and East European Studies, the Normal Paterson School of International Affairs, and the Paterson Centre for International Programs at Carleton University. This annual lecture was established in 1982.

Officers of the University

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Arthur Kroeger, O.C., M.A., LL.D.

President and Vice-Chancellor

Richard J. Van Loon, B.Sc., M.A., Ph.D.

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Marion Dewar, R.N., BSc.N., Dip.PH.N.

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The Chancellor

The President and Vice-Chancellor

Elected Members

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Joe Belfontaine

Louise Bergeron-de Villiers, B.A.

Iris L. Craig, B.A.

Marion Dewar, R.N., BSc.N., Dip.PH.N.

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Lloyd Stanford, M.A.

James Taggart, B.Eng.

Retire June 30, 2000

Colin Betts, B.A.(Hons.)

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Michael Makin, B.J.

Claudine Simson, B.Sc., Ph.D.

Retire June 30, 2001

K.S. Andonian, M.Arch., M.A.Sc., Ph.D.

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Jocelyn Ghent Mallett, B.A., M.A., Ph.D.

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Judith Moses, B.A.

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J. Clarkson

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 Associate Professor T. Smy, B.Sc., Ph.D.
 Professor C.L. Tan, B.Sc., Ph.D.
 Professor D.R. Thomas, B.Sc., Ph.D., M.Sc.
 Mr. Ryan S. Ward
 Mr. Thane Wilson

Special Appointments

Associate Professor R. Bird, B.A., M.A., Ph.D.
 Professor C.H. Chan, B.Sc., M.A.Sc., Ph.D., P.Eng. (Clerk of Senate)
 Mr. Martin Foss, B.A., B.L.S.
 Mr. D. Thomson, M.C.S.

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University Secretary

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Abd El Halim, A.O.	Civil and Environmental Engineering	Bell, Michael	Art History
Abdo, Nahla	Sociology and Anthropology	Bell, Robert	Mechanical and Aerospace Engineering
Abel, Kerry	History	Bellamy, David	Political Science
Abele, Frances D.	Public Administration	Bennett, David	Geography and Environmental Studies
Acheson, A.L. Keith	Economics	Bennett, Scott E.	Political Science
Adam, Christine L.	Centre for Initiatives in Education	Bennett, Steffany A.L.	Biochemistry
Adam, G. Stuart	Journalism and Communication	Bennett, Y. Aleksandra	History
Advokaat, Linda	Social Work	Bernstein, Jeffrey I.	Economics
Afagh, F.F.	Mechanical and Aerospace Engineering	Bibby, Malcolm J.	Mechanical and Aerospace Engineering
Aitken, Victor	Engineering	Bienefeld, Manfred A.	Public Administration
Alboim, Elly	Journalism and Communication	Bird, Roger	Journalism and Communication
Alexander, Jon	Political Science	Black, F.W.	Mechanical and Aerospace Engineering
Alvi, Shahid	Sociology and Anthropology	Black, J. Laurence	History
Anderson, Leigh	Public Administration	Blenkinsop, John	Earth Sciences
Andonian, K.S.	Architecture	Blockley, R.C.	Classics
Andrews, Donald A.	Psychology	Blundell, Valda J.	Sociology and Anthropology
Anisman, Hymie	Psychology	Bohm, Arnd	German; Comparative Literary Studies
Anselmi, William	Italian	Bordeleau, Francis	Computer Science
ApSimon, J.W.	Chemistry	Bose, Amitava	Mathematics and Statistics
Armitage, J.C.	Physics	Bose, Prosenjit	Computer Science
Armstrong, Hugh	Social Work; Political Economy; Sociology and Anthropology	Braaksma, John P.	Civil and Environmental Engineering
Armstrong, Keir	Economics	Brecher, Richard Alan	Economics
Arnup, Katherine	Canadian Studies	Bressani, Martin	Architecture
Artemev, A.V.	Mechanical and Aerospace Engineering	Brklacich, Michael	Geography and Environmental Studies
Artemeva, Natalia	Linguistics and Applied Language Studies	Brook, J.A.	Philosophy
Atkinson, Gail M.	Earth Sciences	Brown, Chris	Political Science
Attallah, Paul	Journalism and Communication	Brown, R.L.	Earth Sciences
Bailetti, A.J.	Business; Systems and Computer Engineering	Buchanan, Gerald W.	Chemistry
Bailey, Donald L.	Systems and Computer Engineering	Buhr, Raymond J.A.	Systems and Computer Engineering
Banihashemi, Amir	Systems and Computer Engineering	Buist, Peter H.	Chemistry
Barber, Marilyn J.	History	Burk, R.C.	Chemistry
Barratt, Glynn	Russian ; Comparative Literary Studies	Burke, Brenda	French
Bartholomew, Amy L.	Law	Burn, Chris	Geography and Environmental Studies
Basseville, Vincent	French	Burns, Brian P.	Industrial Design
Bauer, G.E.	Civil and Environmental Engineering	Callahan, John R.	Business; Systems and Computer Engineering
Bawagan, Alexis D.O.	Chemistry	Cameron, M. Ian	English Language and Literature
Beauchemin, Steven	Computer Science	Cameron, Maxwell A.	International Affairs
Beddoes, Jonathan C.	Mechanical and Aerospace Engineering	Campbell, J.D.	English Language and Literature
Beecher, Donald A.	English Language and Literature	Campbell, R. Lynn	Law
Beer, D.G.	Classics	Cappuccino, Naomi	Biology
Bell, J. Barry	Architecture	Caputo, Tullio C.	Sociology and Anthropology
Bell, Keith	Earth Sciences	Caputo, Virginia	Women's Studies
		Cardy, Patrick R.T.	Music
		Carment, David B.	International Affairs
		Carmichael, Calum M.	Public Administration

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Carson, Richard Lee	Economics	Dehne, Frank	Computer Science
Cazabon, Yvan-pier	Architecture	DeKeseredy, W.S.	Sociology and Anthropology
Chaly, Nathalie	Biology	de Leeuw, Martien	Industrial Design
Champagne, Pascale	Civil and Environmental Engineering	Della Sala, Vincent	Political Science
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Chandler, Andrea S.	Political Science	Demers, Michel	Economics
Cheetham, James J.	Biology	de Montigny, Gerald	Social Work
Chen, Zhiqi	Economics	De Pourbaix, R.K.T.	Linguistics and Applied Language Studies
Cherry, Frances	Psychology	Deugo, Dwight	Computer Science
Chevalier, J.	Sociology and Anthropology; Comparative Literary Studies	Devetsikiotis, Mihail	Systems and Computer Engineering
Chinneck, John W.	Systems and Computer Engineering	de Vries, John	Sociology and Anthropology
Chouchani, George E.	Linguistics and Applied Language Studies	Dickson-Gilmore, Jane	Law
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Copeland, Miles	Electronics	Doern, G.B.	Public Administration
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Cove, John J.	Sociology and Anthropology; Religion	Doubleday, Nancy	Geography and Environmental Studies
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Cray, David	Business; Sociology and Anthropology	Dourley, John P.	Religion; Sociology and Anthropology
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		Elliott, David W.	Law

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Frizzell, Alan	Journalism and Communication	Hogg, Robert L.	English Language and Literature
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Kennedy, Stephen J.	Civil and Environmental Engineering	Long, David P.	International Affairs
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Razaqpur, A.G.	Civil and Environmental Engineering	Schwartz, Saul	Public Administration
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Resnick, Lazer	Physics	Shepherd, John	Music; Sociology and Anthropology
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Robinson, Fiona	Political Science	Smart, Patricia	French; Comparative Literary Studies
Robinson, S.	French	Smith, Derek G.	Sociology and Anthropology
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Rosse, D.	French	Smith, Julian	Canadian Studies
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Rothman, Eugene	Religion	Smith, Myron Lloyd	Biology
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Rowlands, Dane	International Affairs	Snelgrove, W. Martin	Electronics
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Ruprecht, A.	French	Stainton, R.J.	Philosophy; Linguistics and Applied Language Studies
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Ryan, Philip	Public Administration	Steffens, Caryll	Sociology and Anthropology
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		Strickland, Lloyd H.	Psychology
		Suter, G.T.	Civil and Environmental Engineering

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von Riekhoff, Harald	Political Science		
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Wang, Zhi Yuan	Chemistry		
Warskett, Rosemary E.	Law; Sociology and Anthropology		
Watkinson, D.H.	Earth Sciences		
Watson, P.J.S.	Physics		

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Notes

Notes

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